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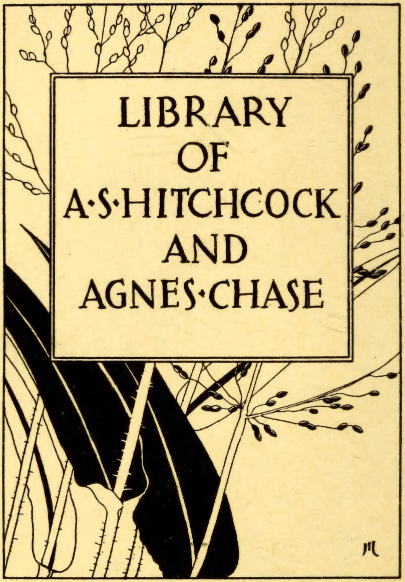

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Elysium Marianum

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FERNS AND FERN-ALLIES

by

IVAR TIDESTROM

◆

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Ivar Tidestrom.

PREFACE

There is perhaps no study which gives a greater pleasure to the mind than botany in all its details. No study has a more elevating and refining influence when pursued for its own sake, than this inexhaustible subject, based as it is upon an infinite number of forms -- expressions of beauty, use and wisdom.

The forms appeal to us first; their study and natural grouping should therefore claim our earlier attention, while a knowledge of their anatomy and their very nature should be acquired as a necessary complement in order to get a truer view of plant-life.

Omnis vera cognitio cognitione specifica innitatur. (Linnæus). This is true and this should lead us to the study of our plants in their native haunts. Valuable as is a knowledge, gained by others and handed down to us in literature; yet the best knowledge is acquired through the things themselves.

A knowledge of plant-life has its own reward: *si ad naturam vives, numquam eris pauper: si ad opiniones, numquam eris dives.* [Epicurus; Seneca, Epist. 16]. The aid it gives to the philosophic mind is inestimable as the created nature is the only rational basis for philosophy.

How much easier it is to appreciate the Good, the Beautiful and the True about us, when we have some knowledge -- be it ever so small -- of plant-life and its innumerable and beautiful forms.

This little volume is designed as an aid in a preliminary determination of a limited group of plants, indiginous to Maryland and Virginia. The works cited in connection with the species are the most recent accessible books on our flora : these should be consulted in critical determinations, as should also the various botanical journals, published in the Eastern United States.

With the exception, perhaps, of two or three species, these notes are primarily the result of field-studies more or less interrupted since 1896. The material in the U. S. National Herbarium has been consulted in order to include all known localities for the rare species.

I am indebted to Mr. F. J. Tyler for the photographs and indirectly to all my co-workers, whose names appear in connection with the rarer species.

Washington. D. C. *Ivar Tidestrom.*

I stooped and picked a leaf of fern,
  And recollected I might learn
From books, how many myriad sorts
  Of fern exist, to trust reports,
Each as distinct and beautiful
  As this, the very first I cull.
Think, from the first leaf to the last!
  Conceive, then, earth's resources! Vast
Exhaustless beauty, endless change
  Of wonder! . . . .

Browning

- Leaves ample.
  - Terrestrial plants.
    - Leaves divided into one fertile and one sterile segment.
      - Segments undivided, plants 1-3 dm. high; sporophyll a distichous spike. 1. Ophioglossum.
      - Segments divided, sporophyll pinnate–3-pinnate. 2. Botrychium.
    - Leaves bearing sporecases upon branched pinnae without parenchyma.
      - Plants trailing; leaf-segments 4-7 palmatifid. 3. Lygodium.
      - Plants robust, erect, 6-20 dm. high. 4. Osmunda.
    - Sporecases forming sori on the lower side of the leaf.
      - Sori without indusia; rootstocks creeping.
        - Leaves pinnatifid.
          - a. glabrous. 5. Polypodium.
          - b. scaly. 6. Marginaria.
        - Leaves triangular, 2-pinnatifid. 7. Phegopteris.
      - Sori borne upon a revolute portion of the leaf margin; stipes straw- or dark-colored.
        - Leaves ternate, branches 2-pinnate. 8. Pteridium.
        - Leaves pinnate, 2- pinnate below. 9. Pellæa.
        - Leaves 2-3-pinnate, pinnules pinnatifid. 10. Cheilanthes.
        - Leaves decompound, pinnules triangular oblong. 11. Adiantum.

Sori forming chainlike rows parallel to the midrib or central vein of the pinnules.
- Leaves uniform, pinnate- pinnatifid. 12. Anchistea.
- Leaves of two kinds, fertile leaves pinnate pinnae linear; sterile leaves deeply pinnatifid. 13. Lorinseria.

Sori linear or oblong, along the veins or scattered.
- Leaves various, veins free.
  - Sori straight. 14. Asplenium.
  - Sori sometimes curved; leaves 2-pinnatifid to 2- pinnate. 15. Athyrium.
- Leaves simple, veins united; sori scattered. 16. Camptosorus.

Sori orbicular.
- Indusia superior; plants robust.
  - Indusium peltate ; leaves pinnate. 17. Polystichum.
  - Indusium reniform; leaves 2-3-pinnate. 18. Dryopteris.
  - Indusium partly superior; leaves 2- 3-pinnate; plants delicate. 19. Filix.
  - Indusium inferior; leaves 2 - pinnate, glandular pubescent: pinnae distant, divaricate. 20. Woodsia.
  - Indusium cupshaped; leaves 3 - pinnatifid. 21. Dennstaedtia.

Leaves of two kinds; sporophylls 3-7 dm. high. pinnate, segments closely rolled together.
- Sterile leaves 2- pinnatifid, 6- 20 dm. high. 22. Mateuccia.
- Sterile leaves triangular, pinnatifid. 23. Onoclea.

Aquatic plants.
  Leaves long-petioled, 4-foliolate; rootstock slender creeping. 24. MARSILIA.
  Leaves linear rigid; stem corm-like; plants small; sporangia axillary. 25. ISOETES.
Leaves minute or rudimentary.
  Plants robust, rush-like; stem hollow-jointed, simple or with verticillate branches. 26. EQUISETUM.
  Plants small, moss-like, erect, or trailing.
    Spores uniform. 27. LYCOPODIUM.
    Spores of two kinds. 28. SELAGINELLA.

1. OPHIOGLOSSUM Trag. 1551.

Lingua serpentina Latinis, Græcis οφἰογλώσσον *& Germanis Naterzuenglin, a fòrma sua . . .* Tragus, 1552. Hist. 323. fig.

Rootstock erect with numerous fleshy roots. Sterile leaf-segment entire, lanceolate to ovate or rotund. Spore cases connate forming a two-ranked spike.

† *Sterile segment obtuse.*

1. O. vulgatum L.   PL. I.

Ophioglossum radice repente. Gron. 1743. Fl. Virg. 196.

Ophioglossum vulgatum L. 1753. Sp. Pl. 1062. *Eaton* 1880. Ferns N. Am. 2:261. t. 81. f. 1-4; 1889. in Gray Man. 695. *Underw.* 1896 in Ill. Fl. 1: 2; 1900 Nat. Ferns 66; 1901. in Br. Man. 2. *Clute,* 1901. Ferns 45. t. 1. *Waters,* 1903. Ferns 25. 341.

ADDER'S TONGUE.

Plants 1-3 dm. high; sterile leaf-segment ovate-elliptic, 3-10 cm. long, inserted below the middle of the petiole; spike 2-4 cm. long.

In meadows and woods, rare.

Terra Cotta, Bennings, Garrett Park, *Holm*; Rock Creek, Bladensburg, Back Lick Run, *Ward*; Md. Agric. Coll., *Vasey*; Upper Marlborough, *Maxon*; Woodside, *Pollard*; Woodburn Manor, Va., *Reynolds*.

Used by the ancients in the healing of wounds; hence the Swedish word *Lœketunga* 'healing-tongue.'

†† *Sterile segment mucronate.*

2. O. Engelmanni Prantl.

Ophioglossum Engelmanni Prantl, 1884. Jahr. koen. bot. Gart. Berlin 3: 318. t. 8. f. 17. *Underw.* 1898. in Ill. Fl. 3: App. 494. f. 1a; Nat. Ferns 67; in Britt. Man. 2.
O. vulgatum Engelmanni Clute, l. c. 48. 316. *Waters*, l. c.

ADDER'S TONGUE.

Plants 1-2 dm. high; sterile leaf-segment elliptic-lanceolate.

Staunton, Va., *W. A. Murrill.*

2. BOTRYCHIUM Sw.

βότρυδον racematim l. in modum racemi . . . . . Gemma incipienti uvae similis Plini 37. 10. Swartz, 1801. Schrad. Journ. Bot. 1800: 2: 110.

Succulent plants. Rootstock erect with many fleshy rootlets. Sterile leaf-segments various; fertile segments pinnate to 3-pinnate or paniculate.

† *Sterile leaf-segment ternate, sessile.*

1. B. virginianum Sw. Pl. I.

Osmunda fronde pinnatifida caulina, fructificationibus spicatis . . Gron. l.c.
Osmunda virginiana L. 1753. Sp.Pl. 1064.

Botrychium virginianum Sw. l. c. 111. *Eaton*, 1878. Ferns N. Am. 1 : 253. t. 33; in Gray, Man. 695. *Underw.* in Ill. Fl. 1 : 4; Native Ferns 74; in Britt. Man. 4. *Clute*, Ferns 41. t. 1. *Waters.* Ferns 25. 337.

VIRGINIAN GRAPE FERN.

Plants 2-6 dm. high; the divisions of the ternate leaf-segment 2-pinnate; sporophyll 2-3-pinnate, long-stalked sometimes forking near its middle forming two panicles; pinnules of the sterile segment are occasionally spore-producing. [Torreya 5 : 160. f. 1.]

Frequent in rich woods. June-August. A slender form [*B. gracile Pursh* 1814. Fl. Am. Sept. 2 : 656.] is occasionally found with the type.

†† *Sterile leaf-segment ternate, stalked.*

* *Pinnules obliquely ovate or oblong-lanceolate.*

2. B. obliquum Muhl. Pl. I.

Lunaria multifido folio crasso . . . ex Terra Mariana . . Pluk. 1700. Mant. 120. t.427. f. 7.

Botrychium obliquum Muhl.; Willd. 1810. Sp. Pl. 5 : 63. *Underw.* Nat. Ferns 72; in Britt. l. c. 3. *Clute*, l. c. 54. *Waters*, l. c. 327.

B. ternatum var. obliquum Eaton, l. c. 1 : 149. t. 20. f. 2; in Gray, l. c. 694. *Underw.* in Ill. Fl. 1 : 3.

GRAPE FERN.

Plants 2-5 dm. high; the divisions of the ternate, sterile leaf-segment 2-pinnatifid or 2-pinnate; pinnules obliquely ovate, the terminal one elongate, margins crenate; sporophyll long-stalked 2-3-pinnate.

In low, damp woods. July- September.

* * *Pinnules dissected.*

3. B. dissectum Spreng. Pl. I.

Lunaria Botryitis ramosa, Geranii moschati foliis . . Pluk. 1705. Almath. 134. t. 427. f.5.
Botrychium dissectum Spreng. 1804. Anl. 3: 172. *Underw.* Nat. Ferns 72; in Ill. Fl. 3: Ap. 494. f. 5.a; in Britt. l. c. 3.
B. ternatum var. dissectum Eaton, l. c. 150. t. 20; in Gray, l. c. 694. *Underw.* in Ill. Fl. 1: 3.
B. obliquum dissectum Clute, l. c. 315. *Waters* l. c. 332.

GRAPE FERN.

Plants 2-6 dm. high; the divisions of the sterile leaf-segment dissected into numerous narrow lobes.

In rich woodlands. July- August.

††† *Sterile leaf-segment pinnatifid- 2- pinnatifid.*

4. B. neglectum Wood. Pl. 3.

B. neglectum Wood, 1846. Class-book 635. *Und.* in Britt. l. c. 1037; Nat. Ferns 70.
B. matricariæfolium of Amer. authors. *Eaton*, l. c. 129. t. 17. ff. 9-14; Gray, l. c. *Underw.* in Ill. Fl. 1: 3. *Clute*, l. c. 315. *Waters*, l. c. 322.

Grape Fern.

Plants 0.5-2 dm. high or more; the sterile segment very variable, borne above the middle of the petiole, the ultimate divisions lobed or entire; sporophyll 2-pinnatifid, the lowest branches nearly equalling the central one.

In rich woods. June.
At Towson, Md., *Waters*; near Washington, *Mrs. Steele*.

Ophioglossum Mariana lingua dentata [Pluk. Phil. Trans. 1698. 398] collected by the Rev. Mr. H. Jones in Maryland is without doubt the small form of *O. vulgatum* found occasionally in damp woods.

Botrychium virginianum was according to Hoffman [7th Ann. Rep. Bur. Ethn. 1891. 201] used by the medecine men of the Ojibwa Indians in the healing of cuts. *B. obliquum* may have had a similar use among the aborigines. The latter is without doubt our most variable species. *Mr. Painter* has found abnormal forms near Washington; *Mr. Maxon* has observed a 2-pinnate form along with typical plants on Salt Pond Mountain, Va.

In Pre-Linnean times *Botrychium lunaria* was used in a like manner. Matthioli [Epit. 643. 1586] speaks of it as follows; *Vulneraria est planta, efficax'q; vulneribus recentibus glutinandis.*

3. LYGODIUM Sw.

Nomen a λυγοδες *flexilis, tortuosus.* Sw. 1801. Schr. Journ. Bot., 1800 : 106.

Climbing plants. Rootstock slender, creeping. Lower pinnae of the leaf sterile; upper ones fertile. Sporecases borne in a double row on the linear lobes of the pinnules.

1. L. palmatum (Bernh.) Sw. Pl. I.
Gisopteris palmata Bernh. Schrad. l. c. 129.
Lygodium palmatum Sw. 1806. Syn. Fil. 154. *Eaton*, Ferns N. Am. 1 : 1. t. 1.; in Gray, Man. 692. *Underw* in Ill. Fl. 1 : 7; Ferns 75; in Britt, Man. 6. *Clute*, Ferns 280. t. *Waters*, Ferns 292.

CLIMBING FERN.

Lower pinnae dichotomously forked; pinnules 4-6 palmatifid, lobes oblong, obtuse; fertile pinnae several times forked, ultimate divisions palmatifid.

In moist woods, rare. July-October.

Near Baltimore, *Dr. Foreman, C. E. Waters*; Anne Arundel Co., *K. A. Taylor, Mr. Waite*; near Riverdale, *Mssrs. Ward, Maxon and Batsch*; Suitland, *E. S. Steele;* Fergussons Wharf Va., *W. D. Turner*,

4. OSMUNDA Lobel. 1570.

This name seems to be of French origin: Vulgo Osmunda in Belgio dicitur . . (Dodon. 1583 Hist. 461.)

. . *a Gallis Osmunde* . . [Dalech. 1586. Hist. 1225.] *The plant was in all probability named in honor of St. Osmonde one of the followers of William the Conqueror, afterwards bishop of Salisbury.*

Robust plants, growing in large clusters. Rootstock creeping. Leaves 2-pinnatifid to 2-pinnate. Sporecases borne on pinnae without parenchyma.

† *Leaves 2-pinnate, upper portion fertile.*

O. regalis L. Pl. 2.

Filix Virginiana, non dentata, florida, foliis alternis . . *Pluk.* Phyt. t. 181. f. 4.

Filix florida, seu Osmunda regalis . . *Gron.* Fl. Virg. 123.

Osmunda regalis L. Sp. Pl. 1065. *Eaton*, Ferns N. Am. 1 : 209. t. 28; in Gray, Man. 693. *Und.* in Ill. Fl. 1 : 5 : Nat. Ferns; in Britt. Man. 4. *Clute*, Ferns 32. *Waters*, Ferns. 298.

OSMUND THE WATERMAN. ROYAL FERN.

Plants 1 m. high or more; rootstock stout, bearing a cluster of 2-pinnate leaves; pinnules oblong or lanceolate-oblong, sessile or nearly so, very variable; uppermost pinnae spore-bearing.

In wet, shaded places. June- August.

Near Baltimore, *Waters*; in low places about Washington; in Dismal Swamp, Va., *Coville*, *Kearny*, *W. Palmer;* Portsmouth, *Britton and Small.* At Chesapeake Beach, Md., this fern is at its best — a true queen among our ferns.

O. regalis was used extensively in medecine in Pre-Linnean times. *Radix Osmundae regalis* and *Medulla radicis Osmundae* were used in various ways by the earlier herbalists

The Virginian plant was distinguished by Linnaeus as *Osmunda regalis β.* and by Willdenow as *O. spectabilis* [Willd. Sp. Pl. 5 : 96.]. Typical plants do not seem to differ materially from the European form. The former was described as having *pinnulis . . omnibus alternis*. Sterile specimens collected along with typical plants near Washington, D. C., have nearly all pinnae opposite and other characters attributed to the European form.

†† *Leaves 2-pinnatifid.*

* *2-5 of the middle pinnae fertile.*

2. O. Claytoniana L.

Osmunda Claytoniana L. l. c. 1066. *Eaton*, l. c. 219. t. 29. ff. 1,2 ; in Gray, l. c. *Underw.* i nIll. Fl. 1 : 6. Nat. Ferns 77 ; in Britt. l. c. 4. *Clute*, l. c. 30. *Waters*, l.c. 303.

CLAYTON'S FERN.

Plants 6--12 dm. high ; leaves oblong lanceolate, the pinnae 0.5--1.5 dm. long, the ultimate divisions rounded ; fertile leaves somewhat taller than the sterile ones ; spore-bearing pinnae reduced.

In moist woods. May..June.

** *Fertile leaves distinct, sterile pinnae with an axillary tomentum.*

3. O. cinnamomea L. Pl. 3.

Filix botryitis Virginiana . Moris. 1699. Hist. 3 : 593. sect. 14. t. 4. f. 3.

Osmunda arborea . . surculis seminiferis radicalibus. Gron. Fl. Virg. 2 : 196.

O. cinnamomea L. l. c. 1066. *Eaton*, l. c. 227. t. 29. ff. 3-5 ; in Gray, l. c. 693. *Underw.* in Ill. Fl. 1 : 5 ; Nat. Ferns 77 ; in Britt. l. c. 4. *Clute*, l. c. 25. *Waters*, l. c. 307.

CINNAMON FERN.

Plants 5-18 dm. high, clothed with a rusty tomentum when young ; sterile leaves clustered ; pinnae linear-lanceolate ; fertile leaves 2-pinnate ; sporecases cinnamon-colored.

In swamps and shaded woods.

O. cinnamomea frondosa Eaton (in Gray, l. c.) with the lower pinnae sterile and the upper spore-bearing, has been observed at Laurel, Md., by *Pollard;* and var. *glandulosa Waters* (Fern Bul. 10 : 21.) by *Waters and Maxon.*

5. POLYPODIUM Theophr.

Polypodium a vocibus Graecis πολυ *multum &* πους *Pes, quasi diceretur planta multipes ob radicum formam.* Tournef. 1700. Inst. 541.

Rootstock creeping, scaly. Leaves various. Sporecases borne in sori without indusia.

1. P. vulgare L.

Polypodium minus alterum? Banist.; Ray, Hist. 1926.

P. vulgare L. Sp. Pl. 1085. *Eaton*, Ferns N. Am. 1: 237. t. 31. ff. 1-3; in Gray, Man. 680. *Underw.* in Ill. Fl. 1: 32; Nat. Ferns 82; in Britt. Man. 7. *Clute*, Ferns 196. *Waters*, Ferns 79.

WALL FERN, POLYPODY.

Plants 1–2.5 dm. high; leaves deeply pinnatifid; sori large, situated midway between the margin and the midrib.

In rocky places.

The rootstocks of this species were used in the art of medecine by the ancients: *radix in usu* . . (Plin. Hist. 26: 58.). In Scandinavia they are much appreciated by the children, who delight in gathering *stensoeta*.

6. MARGINARIA Bory.

Rootstock creeping, scaly. Leaves various, lower face densely scaly. Sori marginal, without indusia.

1. M. polypodioides (L.) Pl. 1.

Filix s. Polypodium . . *Virginianum*. Pluk. 1692. Phyt. t. 289. f. 1.

Acrostichum fronde pinnata . Gron. Fl. Virg. 2 : 198.
A. polypodioides L. Sp. Pl. 1068.
Polypodium incanum Sw. 1788. Prodrom. 131. *Eaton*, Ferns N. Am. 1: 197. t. 26. f 2; in Gray, Man. 680. *Clute*, Ferns 198.

P. polypodiodes A. S. Hitchcock, 1893. Rep. Missouri Bot. Gard. 156. *Underw.* in Ill. Fl. 1 :33 ; Nat Ferns 82 ; in Britt. Man. 7. *Waters*, Ferns 83.
Marginaria polypodioides Tm. 1905. Torreya 5 : 171.

GRAY WALL FERN.

Plants 0.5..1.5 dm. high ; leaves nearly pinnate, coriaceous, thickly covered on the lower side with grayish scales ; sori near the margin.

On rocks or trees.

Near Great Falls, Md., *W. P, Hay* ; Dismal Swamp Va., *Ward*, *Coville* ; Marion Co., *Miss Vail*, *Small.*

7. PHEGOPTERIS Fee.

Mot a mot fougere du hetre. Ce genre a pour le type Phegopteris des auteurs (φηγός,*hetre* ; πτερὶς *fougere)* Fee, 1851. Gen, Fil. 361.

Rootstock slender, creeping. Leaves triangular, 2-3pinnatifid or ternate. Sporecases in sori without indusia.

† *Leaves triangular, 2-pinnatifid.*

* *Leaves broader than long.*

1. P. hexagonoptera (L. C. Rich.) Fee.
Filix mas rachi seu nervo medio alato. Banis. Cat.; Ray, 1688. Hist. Pl. 2: 1926.
Polypodium hexagonopterum L. C. Rich.; Mx. Fl. 2: 271.
Phegopteris hexagonoptera Fee, l. c. *Eaton*, Ferns N. Am. 2: 147. t. 65; in Gray, Man. 686. *Underw.* in Ill. Fl. 1: 19; Nat. Ferns 109; in Britt. Man. 16. *Clute*, Ferns 202. *Wat.* Ferns 189.

BEACH FERN.

Plants 3 dm. or more high; leaves nearly equilaterally triangular; pinnae adnate to the rachis, the lowermost sometimes 1 dm. l., lanceolate, with crenate-dentate segments; segments of the upper pinnae denticulate or entire; sori small near the apices of the free veinlets.

In open, dry woods. June-August.

** *Leaves longer than broad.*

2. P. connectilis ((L. C. Rich.) Watt.
Polypodium phegopteris L. Sp. Pl. 1089.
P. connectile L. C. Rich.; Michx. Fl. 2: 271,
Phegopteris polypodioides Fee, l. c. 243. *Eat*, l. c. 2: 217. t. 75; in Gray, l. c. 686. *Clute*, l. c. 200. *Waters*, l. c. 184.

P. phegopteris Underw.; *Small*, Bull. Torr. Cl. 20:462. *Underw.* in Ill. Fl. 1: 19; Nat Ferns 108; in Britt. l. c. 16.
P. connectile Watt, 1869. Can. Nat. Ser. 2. 4: 363.

BEACH FERN.

Plants 3 dm. or more high; leaves triangular, pubescent on the veins below; lowest pinnae less than 1 dm. long, segments entire or nearly so.

In recent Manuals this fern is reported growing as far south as the mountains of Virginia. I have collected it in Vermont where it is common. I have seen specimens from Watkin's Glen, N. Y., and Ganoga Lake, Pa.

†† *Leaves ternate.*

3. P. dryopteris (L.) Fee. Pl. 4.
Polypodium dryopteris L. l. c. 1093.
Phegopteris dryopteris Fee, l. c. 243. *Eaton*, l. c. 1: 157. t. 21; in Gray, l. c. 686. *Und.* in Ill. Fl. 1: 19; Nat. Ferns 109; in Britt. l. c. 17. *Clute*, l. c. 203. *Waters*, l. c. 194.

OAK FERN.

Plants 3 dm. or more high; the divisions of the ternate leaf 2-pinnatifid; pinnae sessile or nearly so, segments rounded.

Collected on Stony Man Mountain, Va., by *Palmer* aud *King*.

8. PTERIDIUM Scopoli, 1760.

The name Pteridion was applied by Valer. Cordus [Hist. de Plantis 2 : 170. 1561] *to Phegopteris dryopteris. The ancient name for the Eagle Fern was without doubt Thelypteris.*

Rootstock long, creeping, blackish. Leaves usually ternate. Sporecases borne in sori upon a revolute portion of the leaf-margin. Indusium membranous.

1. P. aquilinum (L.) Kuhn.

Filix foemina, foliis per margines pulverulentes . . Ban. Cat.; Ray, Hist. Pl. 2 : 1928.
Pteris fronde supradecomposita . . Gron. Fl. Virg. 2 : 197.
Pteris aquilina L. Sp. Pl. 1075. *Eaton*, Ferns N. Am. 1 : 263. t. 35; in Gray, Man. 681. *Underw.* in Ill. Fl. 1 : 28. *Clute*, Ferns 69. *Waters*, Ferns 93.
Pteridium aquilinum Kuhn, 1879. in Decken's Reisen 3 : 11. *Underw.* Ferns 91; in Britt. Man. 8.

EAGLE FERN. BRACKEN.

Plants 5-20 dm. or more high; leaves ovate-triangular or ternate, 2-3-pinnate at the base; pinnules variously lobed, or entire.

In sunny places, on hillsides, in old fields or along railroad-banks. Summer.

The rootstocks of this species were used as food by the northern Indians. (Dr. E. Palmer) ;in Japan, the rootstocks and young leaves are used in a similar manner (Duchesne) ; in Europe the leaves are used for bedding ; the plant was formerly used in obtaining potash.

9. PELLÆA Link.

Stipes rigidus badius unde Pellæam [πελλός, dark-colored] dixi . . Link, 1841. Fil. Hort. Berol. 59.

Rock-loving ferns. Rootstock short, ascending or slender, creeping. Leaves pinnatifid- 3-pinnate, stipes dark-colored. Sori borne along the revolute portion of the leaf-margin.

1. P. atropurpurea (L.) Link. Pl. 3.

Filicula saxatilis Osmunda facie . sive Adiantum Marianum . . *Pluk.* Mant. 81. t. 349.

Pteris Adianti facie caule ramulis petiolisque politiore nitore nigricantibus . . *Gron.* Fl. Virg. 2 : 197.

Pteris atropurpurea L. Sp. Pl. 1076.

Pellœa atropurpurea Link, l. c. *Eaton*, Ferns N, Am. 2 : 61. t. 54. ff. 4-7 ; in Gray, Man. 682. *Underw.* in Ill.Fl. 1 : 29 ; Nat. Ferns 98 ; in Britt. Man. 9. *Clute*, Ferns 84. *Waters*, Ferns 113.

CLIFF BRAKE.

Plants 1--4 dm. high; leaves pinnate, 2-pinnate below; pinnae linear-oblong, 1-4 cm. l., 1 cm. or less wide; stipes dark-brown.

In crevices of rocks. July-September.

Along Gunpowder River and in Ann Arundel Co. *Waters*; near Harper's Ferry; Great Falls, *Ward;* Plummers Island, *Topping;* Rock Creek, *Oliver*; Georgetown, *E. S. Steele*, Analostan Isl'd, *Burgess and Smith*; Alexandria, *Ward, Vasey*; Front Royal, Va. *G. S. Miller;* Natural Bridge, *Maxon*; Beaver Dam Falls, *Steele*.

10. CHEILANTHES Sw.

Nomen a χεῖλος, *Margo et* ανθός, *Flos. Sw.* Syn. 126.

Rock-loving ferns, growing usually in clusters. Rootstock short, more or less stout. Leaves 2-3 pinnate. Indusia confluent or distinct.

† *Leaves 2-pinnate, glabrous or nearly so.*

1. C. alabamensis (Buckl.) Kunze.

Pteris alabamensis Buckl. 1843. Amer. Journ. Sc. 45: 177.

Cheilanthes alabamensis Kunze 1847. Linnaea 20: 4. *Eaton*, Ferns N. Am. 2: 89. t. 57. ff. 7-9; in Gray, Man. 681. *Underw.* in Ill. Fl. 1: 30; Nat. Ferns 93; in Britt. Man. 9. *Clute*, Ferns 242. *Waters*, Ferns 98.

ALABAMA LIP FERN.

Plants 1--3 dm. high; leaves lanceolate, 2-pinnate below, 2-pinnatifid or pinnate towards the apex; pinnae ovate-- or oblong-lanceolate, 0.5--2 cm. l., pinnules oblong, variously toothed or entire; stipes slender, wiry, blackish.

In crevices of rocks.

Reported from the mountains of Virginia. I have seen specimems from the mountains of North Carolina and Tennessee but none from Virginia.

†† *Leaves 3-pinnatifid, hirsute.*

2. C. lanosa (L. C. Rich.) Watt. Pl. 2.

Nephrodium lanosum L. C. Rich.; Michx. Fl. 2 : 270.

Cheilanthes vestita Sw. l. c. *Eaton*, l. c. 1 : 13. t. 2. ff. 2; in Gray, l. c. 681. *Clute*, l. c. 237. *Waters*, l. c. 100.

C. lanosa Watt, 1874. Journ. Bot. 12 : 48. *Und.* in Ill. Fl. 1 : 31; Ferns 93; in Britt, l. c. 9.

HAIRY LIP FERN.

Plants 1–2.5 dm. high, and growing in clusters; leaves oblong-lanceolate, pinnae ovate-lanceolate, 1-2 cm. long, pinnules rather distant.

In crevices of rocks. July--August.

Near Baltimore, *Waters*; Great Falls, *Holm*, *Topping*, *Ward*; Campbell Co. Va., *Miss Fauntleroy*; Greenville Co. *Heller*. Abundant at Harper's Ferry where it forms conspicuous clusters, adorning the rocks.

††† *Leaves 3-pinnate, tomentose.*

3. C. tomentosa Link.

Cheilanthes tomentosa Link, 1833. Hort. Ber. 2 : 42. *Eaton*, l. c. 1 : 345. t. 45. ff. 1-5 ; in Gray, l, c. 681. *Underw.* in Ill. Fl. 1 : 31 ; Nat. Ferns 94 ; in Britt. l. c. 10. *Clute*, l. c. 239. *Waters*, l. c. 108.

WOLLY LIP FERN.

Plants 1-4 dm. high,more or less beset with a brown tomentum ; leaves linear-lanceolate ; ovate-lanceolate, rather distant, 1-3 cm. l. ; secondary pinnae oblong, 1 cm. or less l. ; pinnules minute.

In crevices of rocks.

Reported from the mountains of Virginia. I have seen this fern in the mountains about Chattanooga, Tenn.; it has the same range as the preceding species.

11. ADIANTUM Diosc.

Adiantum, Graecis, Adianton. Officinis Capillus Veneris . . Camer. 1586. De Plantis . . 924.

Handsome ferns preferring rocky woods. Leaves various ; stipes brown or dark-colored. Sporecases borne at the end of the free veinlets and covered by a reflexed portion of the leaf-margin.

† *Leaves dichotomously forked.*

1, A. pedatum L. Pl. 5.

Adianthum fruticosum americanum [e Virginia, John Tradescant] Park. 1640. Theat. 1049. f. 3.

Adiantum fronde supra decomposita bipartita . . . Gron. Fl. Virg. 123.

Adiantum pedatum L. Sp. Pl. 1095. *Eaton*, Ferns. N.Am. 1: 135. t. 18; in Gray, Man. 680. *Underw.* in Ill. Fl. 1:27; Nat. Ferns 90; in Britt. Man. 8. *Clute*, Ferns 242. *Waters*, Ferns 88.

MAIDENHAIR FERN.

Plants about 5 dm. high; leaves dichotomously forked or decompound; pinnules or ultimate divisions triangular oblong, 2 cm. or less l.

In rich deciduous woods. Summer.

†† *Leaves with a continuous rachis.*

2. C. Capillus-Veneris L. Pl. 5.

Adiantum Capillus-Veneris L. l. c. 1096. *Eat.* l. c. 281. t. 37; in Gray, l. c. 680. *Underw.* in Ill. Fl. 1: 27; Nat. Ferns 89; in Britt. l. c. 7. *Clute*, l. c. 246. *Waters*, l. c. 91.

MAIDENHAIR FERN.

Plants about 4 dm. high or more; leaves ovate-lanceolate; pinnae alternate; pinnules wedge-obovate, irregularly incised.

Reported from Southern Virginia. I have not seen this handsome fern in its wild state. It is undoubtly our handsomest cultivated fern. It holds its own in beauty with the preceding species.

The leaves of *A. Capillus. Veneris* have been used in the art of medecine from time immemorial; they are known in pharmacy as *Herba Capillorum Veneris s. Folia Capilli* and were used in making a sirup (*Syrupus Capillorum*). The medecine men of the Cherokees used a decoction from *A. pedatum* against rheumatism and chills. [J. Mooney, in 7th. Ann. Rep. Bur. Ethn. 326. 1891.]

12. ANCHISTEA. Presl.

Nomen derivatum ab αγχιστεὄς *agnatus, affinitatem cum Woodwardia et Doodia indicans.* Presl, 1849. Epimel. Bot. 71,

Robust ferns. Rootstock long, creeping. Leaves of one kind. Sori oblong in rows along the midrib of the pinnae and the central vein of the lobes.

1. A. virginica (L.) Presl.

Filix mas vulgari similis . . *Pluk.* Phyt. 3: t. 179. f. 2.
Blechnum virginicum L. 1771. Mant. 2: 307.
Woodwardia virginica J. E. Smith, 1793. Mem. Acad. Turin, 5: 412. *Eaton*, Ferns N. Am. 2: 45. t.52; in Gray, Man.683. *Underw.*

in Ill.Fl.1 : 20; Nat Ferns 102; in Britt. Man. 10. *Clute*, Ferns 219. *Waters*, Ferns 121.
Anchistea virginica Presl, l. c.

VIRGINIAN CHAIN FERN.

Plants 5-10 dm. high; leaves 2-pinnatifid; pinnae alternate, lanceolate, 0.5-1.5 dm. l. sori at length confluent.

In moist woods and swamps. Summer.
Near Baltimore, *Waters*; Laurel, *Pollard*; Beltsville, *Olds*; Hyattsville, *Painter*, *House*; Terra Cotta, *Holm*; Deanwood, *Kearny*; Reform School, *Ward*, *Palmer*, *Knowlton*; Dismal Swamp. Va., *Kearny*, *Pollard*, *Palmer*; Cape Henry, *Mrs. A. Chase*.

13. LORINSERIA Presl.

Genus dicatum in honorem Gustavi Lorinser. Presl, Epimel. Bot. 72.

Robust ferns. Rootstock long, creeping. Leaves of two kinds. Sori oblong, in rows parallel to the midribs of the pinnae.

1. L. areolata (L) Presl. Pl. 5.
Lonchitis major Virginiana . . Moris. Hist. 3 : 569. sect. 14. t. 2.
Acrostichum fronde pinnata . . Gron. Fl. Virg. 124.
A. areolatum L. Sp. Pl. 1069.

Woodwardia angustifolia J. E. Smith, 1793. Mem. Acad. Turin, 5: 411. *Eat.* Ferns N. Am. 1: 165. t. 22. f. 2; in Gray, Man. 683. *Clute*, Ferns 221. *Waters*, Ferns 124.

Lorinseria areolata Presl, l. c

Woodwardia areolata Moore, Ind. Fil. 45. *Und.* in Ill. Fl. 1: 20; Nat. Ferns 103; in Britt. Man. 10.

CHAIN FERN.

Plants 5 8 dm. high; sterile leaves deeply pinnatifid or nearly pinnate, lobes 5-8 cm. long, 1-2 cm. broad; fertile leaves taller, pinnate: pinnae linear, 5-10 cm. l.

In swamps or wet places. Summer.

14. ASPLENIUM Diosc.

Mostly rock-loving plants. Leaves various. Sori linear, situated along the free veinlets.

† *Leaves pinnatifid, sometimes pinnate.*

* *Lobes usually rounded.*

1. **A. pinnatifidum** Nutt. Pl. 3.

Asplenium pinnatifidum Nutt. 1818. Gen. 2: 251. *Eaton*, Ferns N. Am. 1: 61. t. 8. f. 2; in Gray, Man. 683. *Underw.* in Ill. Fl. 1: 22; Nat. Ferns 103; in Britt. Man. 11. *Clute*. Ferns 167. *Waters*, Ferns 130.

SPLEENWORT.

Low plants with the habit of *Camptosorus rhizophyllus*; leaves lanceolate, 6 cm. or more l., apex attenuate, lobes unequal, usually rounded; sori irregular.

In crevices of rocks. April-July.

Collected in many localities in Pennsylvania, West Virginia and Tennessee, but very rare in our region. Near Harper's Ferry, *Mertz;* Fairfax Co., Va., *Maxon, Palmer.*

** *Lobes elongate.*

2.A. ebenoides Scott.

Asplenium ebenoides Scott; Berk. 1866. Journ. Hort. Soc. 87. t. 2. f. 1. *Eaton*, l. c. 1 : 25. t. 4. f. 2; in Gray, l. c. 684. *Underw.* in Ill. Fl. 1 : 23; Nat. Ferns 103; in Britt. l. c. 11. *Clute*, l. c. 169. *Waters*, l. c. 133.

SPLEENWORT.

Plants 1-2 dm. high; leaves oblong-lanceolate, deeply pinnatifid or sometimes pinnate; lobes or pinnae unequal, 1-3 cm. long; apex of the leaf attenuate.

On limestone rocks, rare.

Towson Md., *Waters;* Plummer's Island, Potomac River, *Palmer*; Blacksburg, Va., *Murrill.*

Botanists hold this species as a hybrid between *Asplenium platyneuron* and *Camptosorus rhizophyllus.*

†† *Leaves pinnate.*

* *Pinnae roundish-oval.*

3. A. trichomanes L. Pl. 2.

Asplenium trichomanes L. l. c. 1080. *Eaton*, l. c. 1 : 271. t. 36. ff. 1-3; in Gray, l. c. 684. *Underw.* in Ill. Fl. 1 : 24; Nat. Ferns 104; in Britt. l. c. 11. *Clute*, l. c. 155. *Waters*, l. c. 139.

MAIDENHAIR SPLEENWORT.

Plants 1-2 dm. high, growing in clusters; leaves linear; pinnae about 5 mm. l., entire or crenate; stipes dark-brown.

In crevices of rocks. April-August.

** *Pinnae oblong, mostly opposite.*

4. A. resiliens Kunze.

Asplenium parvulum Mart. & Gal. Syn. Filic. Mex. 60. t. 15. f. 3. not Hooker. *Eaton*, l. c. 1 : 279. t. 36. ff. 5-6; in Gray, l. c. 684. *Und.* in Ill. Fl. 1 : 23; Nat. Ferns 104; in Britt. l. c. 11. *Clute*, l. c. 159.

A. resiliens Kunze, 1844. Linnaea 18: 331. *Waters*, l. c. 142.

EBONY SPLEENWORT.

Plants 1-1.5 dm. high; leaves linear, rather rigid; pinnae very numerous, subequal, obtuse, entire or nearly so, 0.5 cm. or longer, auricled on the upper side; stipes black, shining.

On limestone rocks.

Alexandria Co., Va., *Palmer*; Lexington, *Waters*.

*** *Pinnae oblong, mostly alternate.*

5. A. platyneuron (L.) Oakas. Pl. 4.

Trichomanes major foliis longis, auriculatis. Banist. Cat.; Ray, Hist. 2: 1928.

Acrosticum platyneuron L. l. c. 1069.

Asplenium ebeneum Ait. 1789. Hort. Kew. 3: 462. *Eaton*, l. c. 1: 21. t. 4. f. 1; in Gray, l. c. 684. *Clute*, l. c. 160. *Waters*, l. c, 144.

A. platyneuron Oakes; Eaton, l. c. 24 in note. *Underw.* in Ill. Fl. 1: 23; Nat. Ferns 104; in Britt. l. c. 11

EBONY SPLEENWORT.

Plants 2-5 dm. high; leaves linear, tapering towards the base; pinnae oblong, truncate at the base, sessile, auricled on the upper side, 1-3 cm. l., denticulate or sometimes incised.

In rocky places. April-September.

††† *Leaves pinnate to 3-pinnatifid.*

* *Leaves 2-pinnatifid below, pinnate above.*

6. A. Bradleyi D. C. Eaton. Pl. 4.

Asplenium Bradleyi D. G.Eaton, 1873. Bull. Torr. Bot. Cl. 4: 11; Ferns N. Am. 2: 39. t. 51. ff. 4-8.; in Gray, l. c. 684. *Underw.* in Ill. Fl. 1: 26; Nat. Ferns 106; in Britt. l. c. 12. *Clute*, l. c. 166. *Waters*, l. c. 150.

BRADLEY'S FERN.

Plants 1 dm. more or less high; leaves linear-lanceolate; pinnae ovate-oblong, somewhat auricled, pinnatifid or simply dentate, 1 cm. or less l.; stipes brown.

In crevices of rocks.

Along Patapsco River, *Maxon*, *Waters*.

7. A. montanum Willd.

Asplenium montanum Willd. 1810. Sp. Pl. 5: 342. *Eaton*, l. c. 2: 41. t. 51. ff. 9-11; in Gray, l. c. 684. *Underw.* in Ill. Fl. 1: 25; Nat. 106; in Britt. l. c. 12. *Clute*, l. c. 164. *Waters*, l. c. 154.

MOUNTAIN SPLEENWORT.

Plants 0.5-1 dm. high; leaves ovate-lanceolate, usually 2-pinnatifid; pinnae somewhat ovate-oblong, incised or pinnatifid, cuneate, the ultimate divisions variously toothed; stipes green except at the base.

In crevices of rocks.

Along Patapsco River, Md., *Maxon*, *Waters*; above Great Falls Va., *Palmer*; Salt Pond Mt., *Britton*, *Maxon*; Smyth County,, *Small*; Giles Co., *Richardson*.

In crevices of rocks.

Along Patapsco River, *Waters*; above Great Falls, *Palmer*; Salt Pond Mountain, Va., *Britton*, *Maxon*, *Pollard*; Smythe Co., *Small*; Giles Co., *Richardson*.

††† *Leaves 2-pinnate to 3-pinnate below.*

8. A. ruta-muraria L. Pl. 4.

Asplenium ruta-muraria L. l. e. 1081. *Eaton*, l. c. 1: 107. t. 15. f. 1; in Gray, l. c. 684. *Underw.* in Ill. Fl. 1: 25; Nat. Ferns 106; in Britt. l. c. 12. *Clute*, l. c. 162. *Wat.* l. c. 157.

WALL RUE.

Plants 1 dm. more or less high; ultimate divisions of the leaves rhombic, 6 mm. or less l., apex toothed or incised; stipes green.

In crevices of rocks, or on old walls.

Along Shenandoah River, *Palmer*; Natural Bridge, *Maxon*, *Pollard*; Mount Crawford, *Heller*.

Asplenii species were used in Pre-Linnean times much in the same way as *Adiantnm Capillus-Veneris*. Parkinson (Theat. Bot. 2: 1051. 1640.) says of (*Asplenium*) *Trichomanes*: "This Maidenhair in our Land being more plentifull then the rest" "and both stayeth the shedding of the haire and causeth it to grow thicke".

15. ATHYRIUM Roth.

Athyrium (*a vocabulo* αθυρος *patulum derivatum*) Roth, 1800. Cat. Bot. 2: 143.

Robust ferns. Rootstocks creeping, usually covered by the persistent leaf-bases. Leaves various. Sori more or less curved.

† *Leaves pinnate.*

1. A. pycnocarpon (Spreng.)

Lonchitis maxima foliis planis i. e. non dentatis . . Banist.; Ray, Hist. 2: 1927.

Asplenium angustifolium L. C. Rich.; Michx. Fl. 2: 265. not Jacquin, 1786. *Eaton*, Ferns N. Am. 2: 73. t. 56. ff. 1-3; in Gray, Man. 685. *Underw.* in Ill. Fl. 1: 24; Nat. Ferns 105; in Britt. Man. 12. *Clute*, Ferns 187. *Waters*, Ferns 159.

A. pycnocarpon Spreng. 1804. Anleit. 3: 112.

WOODFERN.

Plants about 9 dm. high; pinnae on the sterile leaves stipitate, oblong-lanceolate, 2-9 cm. l., 0.5-1.5 cm. wide; fertile pinnae 1-6 cm. l., 6 mm. or less wide.

In rich woods; rather rare. Summer.

†† *Leaves 2-pinnatifid.*

A. thelypteroides (L. C. Rich.) Desv.

Asplenium acrostichoides Sw. Schrad. Journ. Bot. 1800: 2 pt. 54. *Underw.* in Ill. Fl. 1: 26; in Britt. l. c. 12.

A. thelypteroides L. C. Rich; Michx. Fl. 2 : 265. *Eaton*, l. c. 2 : 33. t. 50; in Gray, l. c. 685. *Underw.* Nat. Ferns 107.
Athyrium thelypteroides Desv. Mem. Soc. Linn. Paris, 6 : 2pt. 266. *Clute*, Ferns 185. *Waters*, Ferns 163.

SILVERY WOODFERN.

Plants 6-10 dm. high; leaves lanceolate; pinnae linear-lanceolate, acuminate, 7 cm. or less l., 1 cm. wide; ultimate divisions oblong, obtuse, entire or obscurely dentate.

In moist woods. Summer.

†††† *Leaves 2-pinnate to 3-pinnatifid.*

3. A. felix-foemina (L.) Roth.
Polypodium felix-femina L. Sp. Pl. 1090.
Athyrium felix-foemina Roth, 1800. Tent. Fl. Germ. 3 : 65. *Clute*, l. c. 179. *Wat.* l. c. 167.
Asplenium felix-foemina Bernh. 1806. Schrad. Neues Journ. Bot. 1 : 2 pt. 26. *Eaton*, l. c. 2 : 225. t. 76; in Gray, l. c. 685. *Underw.* in Ill. Fl. 1 : 26; Nat. Ferns 107; in Britt. l. c. 12.

LADY FERN.

Plants 4-10 dm. high; leaves clustered at the apex of the stout rootstock; pinnae lanceolate, extremily variable, 4-7 cm. l., rather distant in typical specimens; pinnules oblong, variously toothed or incised, 1 cm. more or less l.

Frequent in woods and thickets.

16. CAMPTOSORUS Link, 1833.

Rock-loving ferns growing in colonies. Leaves simple, rooting at the tips. Sori linear, scattered.

1. C. rhizophyllus (L.) Link. Pl. 2.

Phyllitis parva saxatilis per summitates folii prolifera. Banister; Ray, Hist. 1926.
Asplenium rhizophyllum L. Sp. Pl. 1078.
Camtosorus rhizophyllus Link, Hort. Berol. 2: 69. *Eaton*, Ferns N. Am. 1: 55. t. 8. f. 1; in Gray, Man. 685. *Underw.* in Ill. Fl. 1: 21; in Nat. Ferns 108; in Britt. Man. 13. *Clute*, Ferns 265. *Waters*, Ferns 179.

WALKING FERN.

Low plants; leaves in a cluster from the short rootstock, cordate, auricled or halberd-shaped and gradually narrowed into a long 1 mm. or wider point, which is sometimes 1.5 dm. l. The entire leaf is sometimes 2.5 dm long.

On shaded limestone rocks.

Near Baltimore, *Steitz*, *Waters*; at Cabin John, Md., *Ward*; below Scott's Run, Potomac River, *Maxon*; Stony Man Mount. Va., *Palmer*; Mt. Crawford, *Heller*; Smyth Co., in several places, *Miss Vail*, *Small*.

17. POLYSTICHUM Roth.

Hoc genus Polystichum nominavi (ex verbis πολυ *multum et* στιχος *ordo) quia fructificationum puncta plura in ordines vel series ordinata plerumque observantur.* Roth, 1800. Fl. Germ. 3 : 69,

Rootstock stout, very chaffy. Leaves pinnate, spinulose-serrate. Sori large. Indusium peltate.

1. P. acrostichoides (L. C. Rich.) Schott.

Filix mas foliis integris auriculatis Banister; Ray, Hist. 1926.

Polypodium fronde pinnata lanceolata, foliis lunulatis ciliato-serratis. Gron. Fl. Virg. 123.

Nephrodium acrostichoides L. C. Rich; Michx. Fl. 2 : 267.

Aspidium acrostichoides Sw. Syn. Fil. 44. *Eat.* Ferns N. Am. 1 : 257. t. 34; in Gray, Man. 689.

Polystichum acrostichoides Schott. 1834. Gen. Fil. *Underw.* Nat. Ferns 115; in Britt. Man. 14. *Clute*, Ferns 106. *Waters*, Ferns 244.

Dryopteris acrostichoides Kuntze, 1891. Revis. Gen. 2 : 812. *Underw.* in Ill. Fl. 1 : 14.

CRISTMAS FERN.

Plants 3-6 dm. high; leaves very chaffy below; pinnae 2-8 cm. l., auricled on the upper side, oblong-lanceolate, spinulose-dentate; upper pinnae fertile, reduced and at length covered by the numerous sori.

In dry, deciduous woods.

The form *P, acrostichoides Schweinitzii* (Beck) Small, having toothed or incised pinnae, has been observed by *M. J. H. Painter* at Cabin John, Md.

18. DRYOPTERIS Adans. 1763.

Rootstock creeping or stout, ascending. Leaves 2- 3 pinnatifid. Sori orbicular. Indusium reniform or orbicular, fixed by its sinus.

† *Leaves 2-pinnatifid, pinnae linear-lanceolate.*

* *Pinnae 1 cm. more or less wide, sessile, tapering both ways.*

1. **D. noveboracensis** (L.) A. Gray.
Polypodium noveboracense L. Sp. Pl. 1091.
Aspidium noveboracense Sw. Schrad. Journal Bot. 1800: 2: 38. *Eaton*, Ferns N. Am. 1: 49. t.7; in Gray, Man. 687. *Clute*, Ferns 120.
Nephrodium noveboracense Desv. 1827. Mem. Soc. Linn. Paris, 6: 2 pt. 257. *Waters*, Ferns 209.
Dryopteris noveboracensis A. Gray, 1848. Man. 630. *Und.* in Ill. Fl. 1: 15; Nat. Ferns 111; in Britt. Man. 14.

NEW YORK FERN.

Plants 5 dm. or more high; leaves lanceolate; pinnae 7 cm. or less l., deeply pinnatifid; ultimate segments oblong, obtuse; sori small.

In moist, deciduous woods. Summer.

** *Pinnae 1 cm. more or less wide, sessile, tapering towards the apex of the leaf.*

2. D. simulata Davenp.
Aspidium simulatum Davenp. 1894. Bot. Gaz. 19: 497. *Clute*, l. c. 123.
Dryopteris simulata Davenp. l. c. as syn. *Und.* in Ill. Fl. 1: 16; Nat. Ferns 111; in Britt. l. c. 15.
Nephrodium simulatum Davenp. l. c. as syn. *Waters*, l. c. 205.

MASSACHUSETTS FERN.

Plants 6 dm. or more high; leaves oblong-lanceolate; pinnae 7 cm. or less l., acuminate, deeply pinnatifid; ultimate divisions oblong, obtuse; sori small.

In low, moist woods.

Glen Burnie, Md., *W. Maxon.*

*** *Lower pinnae stalked, 1-2 cm. wide.*

3. D. thelypteris (L.) A. Gray.
Filix pumila palustris Virginiana . . Pluken. Alm. 151. Phyt. t. 284. f. 1.

Acrostichum thelypteris L. l. c. 1071.
Aspidium thelypteris Sw. l. c. 40. *Eaton*, l. c. 1 : 233. t. 30; in Gray, l. c. 686. *Clute*, l. c. 112.
Nephrodium thelypteris Desv. l. c. 257. *Wat.* l. c. 199.
Dryopteris thelypteris A. Gray, 1848. Man. 630. *Underw.* in Ill. Fl. 1 : 15; Nat. Ferns 111; in Britt. l. c. 14.

MARSH FERN.

Plants 3-6 dm. high; leaves lanceolate; pinnae linear-lanceolate, 4-10 cm. l., deeply pinnatifid, ultimate segments rounded, nearly entire; sori small, crowded.

In wet or marshy ground. June-August.

†† *Leaves 2-pinnatifid; pinnae linear-lanceolate to ovate, widest near the middle.*

* *Pinnae 2-4 cm. wide.*

4. **D. Goldiana** (Hook.) A. Gray.
Aspidium Goldianum Hook. 1822. Edinb. Phil. Journ. 6 : 333. *Eaton*, l. c. 1 : 305. t. 40; 1889. in Gray, l. c. 688. *Clute*, l. c. 137.
Dryopteris Goldianum A. Gray, 1848. Man. 631. *Underw.* in Ill. Fl. 1 : 17; Nat. Ferns 113; in Britt. l. c. 15.
Nephrodium Goldianum Hook. & Grev. Icon. Fil. t. 102. *Waters*, l. c. 230.

GOLDIE'S FERN.

Plants 6-15 dm. high; leaves ovate-lanceolate, sometimes nearly 2-pinnate below; pinnae sometimes 1.5 cm. l., deeply pinnatifid; ultimate segments oblong, acute, crenate-dentate.

In moist woods; rare.

Baltimore Co., Md., *Waters;* near Washington, *Ward*, *Vasey*; White Top Mountain, Va., *Small.*

††† *Leaves 2-pinnatifid; pinnae linear, ovate or lanceolate, widest at the base.*

5. D. cristata (L.) A. Gray. Pl. 6.

Polypodium cristatum L, l. c. 1090.

Aspidium cristatum Sw. l. c. 37. *Eaton*, l. c. 2: 153. t. 66; in Gray, l. c. 688. *Clute*, l. c. 139.

Nephrodium cristatum L. C. Rich.; Michx. Fl. 2: 269. *Waters*, l. c. 225.

Dryopteris cristata A. Gray, 1848. Man. 631. *Underw.* in Ill. Fl. 1: 16; Nat. Ferns 113; in Britt. l. c. 15.

CRESTED FERN.

I have never seen the typical *D. cristata* in our region. Closely allied forms are found in Maryland and Virginia. However *Mr. Newman* [Hist. Brit. Ferns 205 1844.] speaks of this species as follows: This fern is of common occurrence on the continent of Europe, and throughout the United States of North America. I have received American specimens from Mr. Oakes, Mr. Lea and Mr. Boott, the latter accompanied by living plants, which have been growing for two years at Leominster, side by side with others from Lynn; and although Mr. Lea, of Cincinnati, informs me that Dr. Torrey considers the American plant distinct, I must confess that the two appear to me to be identical.

* *Pinnae obtuse.*

a. **D. cristata mariana.** Pl. 6.

Plants 7 dm. or less high; leaves linear or nearly so, 2-pinnatifid; pinnae subequal, ovate-oblong, obtuse, 5 cm. or less l., 3 cm. or less wide; lobes crowded, obtuse, sharply serrate; veins forking repeatedly; sori few, about as many as the lobes and borne on the free veinlets, adjacent to the midrib of the pinna; indusium flat, smooth.

In moist woods. May-August.
Montgomery Co., Md. Fairfax Co., Va.

** *Pinnae acute.*

β. **D. cristata lancastriensis** (Spreng.) Pl. 6.
Aspidium lancastriense Spreng. 1804. Anl. 3: 134.

Plants 6 dm. more or less high; leaves lanceolate; lower pinnae triangular-ovate, 4 cm. or less l., the upper oblong, acute, 8 cm. or less l.; lobes rounded, serrate, sinuses rather open; sori about 6 to each lobe.

In moist woods. May-August.

*** *Pinnae acuminate.*

γ. **D. cristata Clintoniana** (D. C. Eaton) Underw.

Plants 6-12 dm. high; pinnae ovate-lanceolate, deeply pinnatifid, 8-15 cm l., sessile or stalked, spreading; lobes usually distant, oblong, obtuse, cut-toothed or serrate; sori borne on the free veinlets near the midvein of the lobes.

Fairfax Co., Va., and Dismal Swamp, *Palmer.*

†††† *Leaves 2-pinnate to 3-pinnatifid.*

* *Pinnules entire or crenate.*

6. **D. marginalis** (L.) A. Gray.
Polypodium marginale L. l. c. 1091.
Nephrodium marginale L. C. Rich.; Michx. Fl. 2 : 267. *Waters*, l. c. 236.
Aspidium marginale Sw. Syn. Fil. 50. *Eaton*, l. c. 2 : 69. t. 55; in Gray l. c. 688. *Clute*, l. c. 134.
Dryopteris marginalis A. Gray, 1848. Man. 632. *Underw.* in Ill. Fl. 1 : 17; Nat. Ferns 113; in Britt. l. c. 15,

WOOD FERN,

Plants 2-6 dm. high; leaves oblong-lanceolate, glaucous beneath; pinnae rather distant, subopposite, 12 cm. or less l., 3 cm. or less wide; pinnules short-stalked or sessile, oblong, acute or obtuse, pinnatifid or nearly entire; sori marginal.

In rocky woods. Summer.

** *Pinnules spinulose-dentate.*

7. D. Boottii (Tuckerm.) Underw.
Aspidium Boottii Tuckerm. 1843. Hovey's Mag. 9: 145. *Eaton*, l. c. 2: 175. t. 69; in Gray, l. c. 687. *Clute*, l. c. 141.
Dryopteris Boottii Underw. 1893. Nat. Ferns ed. 4. 117, ed. 6. 114; in Ill. Fl. 1: 18; in Britt. l.c. 16.
Nephrodium Boottii Waters, l. c. 221.

BOOTT'S FERN.

Plants 3-8 dm. high; leaves linear-lanceolate; lowest pair of pinnae triangular-ovate, 6 cm. more or less long, 2 cm. or less broad at the base; the upper pinnae narrower, 7 cm. or less l., acuminate; pinnules, except the basal pair of the lower pinnae, spinulose-dentate; the latter pinnules are somewhat pinnatifid; sori small.

In moist woods.

Alexandria Co., Va., *Henshaw*; Difficult Run and Springvale, *Palmer*.

††††† *Leaves 3-pinnatifid to 3-pinnate.*

* *Lower pinnae broadly triangular.*

8. D. spinulosa (Retz.) O. Kuntze. Pl. 7.
Polypodium spinulosa Retz. 1795. Fl. Scand. ed. 2. 250.
Aspidium spinulosum Sw. 1801. Schrad. Jour. Bot. 1800: 2 pt. 38. *Eaton*, l. c. 2: 163; in Gray l. c. 687. *Clute*, l. c. .

Nephrodium spinulosum Desv.; Hook. 1861. Brit. Ferns t. 18. *Waters*, l. c. 214.
Dryopteris spinulosa Kuntze, 1891. Rev. Gen. 2 : 813. *Underw*, in Ill. Fl. 1 : 18; Nat. Ferns 114; in Britt. l.c. 16.

WOOD FERN.

Plants 5 dm. more or less high; leaves ovate-lanceolate; lower pinnae 6 cm. more or less long, the basal pinnules exceeding the others in length; upper pinnae elongate-triangular to oblong, acuminate; pinnules oblong, acute, decurrent, pinnatifid; lobes spinulose-dentate; sori small, usually one to each lobe.

In moist woods.

** *Lower pinnae triangular-ovate.*

a. **D. spinulosa intermedia** (Muhl.) Under. Pl. 7.
Polypodium intermedium Muhl.; Willd. 1810. Sp. Pl. 5 : 262.

This form differs from the type by its more spreading pinnae; it is larger, sometimes 3-pinnate and the basal pinnules of the lower pinnae are usually equal to or shorter than the adjacent pair.

In moist woods. Summer.

*** *Lower pinnae unequally triangular-ovate.*

β. **D. spinulosa dilatata** (Hoffm.) Underw.
Polypodium dilatatum Hoffm. 1796. Deutsch. Fl. 2 : 7.

Plants 6 dm. more or less high; leaves usually 3-pinnate below, oblong-ovate; pinnae (except the lowest pair) oblong-lanceolate, 15 cm. or less l.; pinnules oblong, pinntifid or pinnate, the inferior ones of the lowest pair of pinnae much elongated; ultimate segments spinulose-dentate or incised.

White Top Mt., Va., *Small.*

19. FILIX Adans.

This name is the classic name for fern. Its earliest use in the present sense dates from 1763 (Adanson, Fam. 2: 20, 558.), when it was applied to Filix baccifera Corn. 5. (Polypodium bulbiferum L.)

Somewhat delicate ferns. Rootstock short and stout or long, creeping. Leaves variable, usually 2-3pinnate, thin, membranous. Sori small, situated at about the middle of the veinlets. Indusia delicate.

† *Leaves bulbiferous, apex attenuate.*

1. F. bulbifera (L.) Underw.
Polypodium bulbiferum L. Sp. Pl. 1091.

Cystopteris bulbifera Bernh. 1806. Schr. Neu. Journ. Bot. 1 : 2 pt. 26. *Eaton*, Ferns N. Am. 2 : 55. t. 53. ff. 13-17; in Gray, Man. 689. *Underw.* in Ill. Fl. 1 : 12. *Clute*, Ferns 212. *Waters*, Ferns 255.

Filix bulbifera Underw. 1900. Nat. Ferns 119; in Britt. Man. 17.

BULBIFEROUS FERN.

Plants 3-6 dm. or higher; leaves 3-pinnatifid below; pinnae lanceolate, sessile, 6 cm. or less long; pinnules oblong-lanceolate, 2 cm or less l., decurrent on the rachilla, lobes toothed. Easily recognized by its attenuate apex and bulbils (3-4 mm. diameter).

In shaded, rocky places. Summer.

Along Potomac River, Fairfax Co., Va., *Maxon*, *Palmer*; Harper's Ferry *Henshaw*; Natural Bridge, *Evermann*; near Marion, *Miss Vail*, *Mr. Small.*

†† *Leaves with an acute apex.*

2. F. fragilis (L.) Underw.

Polypodium fragile L. l. c.

Cystopteris fragilis Bernh. l. c. *Eaton*, l. c. 2 : 49. t. 53. ff. 1-8; in Gray, l. c. 689. *Und.* in Ill. Fl. 1 : 13. *Clute*, l. c. 209. *Waters*, l. c. 259.

Filix fragilis Underw. 1900. Nat. Ferns 119; in Britt. l. c.

Brittle Fern.

Plants sometimes 4 dm. high, but usually smaller, delicate; leaves lanceolate, 3-pinnatifid; pinnae ovate-lanceolate, 4 cm. or less l.; pinnules ovate, decurrent on the rachilla, lobes entire or toothed.

In rocky places. Summer.

20. WOODSIA R. Br.

This genus I have named in honor of my friend Mr. Joseph Woods . . R. Brown, 1815. Trans. Linn. Soc. 11: 171.

Rootstock short, ascending. Leaves 2-pinnatifid to 2-pinnate. Sori situated near the end of the veinlets. Indusium globular, at length splitting into numerous lobes.

† *Leaves 2-pinnatifid, pinnae somewhat crowded.*

1. W. ilvensis (L.) R. Br.
Acrostichum ilvense L. Sp. Pl. 1071.
Woodsia ilvensis R. Br. l. c. 173. *Eaton*, Ferns N. A. 2: 111. t. 60.ff. 5-8; in Gray, Man. 690. *Underw.* in Ill. Fl. 1: 10; Nat. Ferns 121; in Britt. Man. 18. *Clute*, Ferns 93. *Waters*, Ferns 273.

Rusty Woodsia.

Plants 1-2 dm. high, growing in clusters; leaves linear-lanceolate; pinnae deeply pinnatifid, ovate-oblong, 1 cm. or less l., sessile, more or less covered with a brownish chaff, lobes rounded; sori confluent, at length covering more or less the lower face of the leaf.

In crevices of rocks.

Stony Man Mountain, *E. S. Steele*, *Palmer*, *King*.

†† *Leaves 3-pinnatifid, pinnae rather distant.*

2. W. obtusa (Spreng.) Torr. Pl. 5.

Polypodium obtusum Spreng. 1804. Anleit. 3: 92.

Woodsia obtusa Torr. 1840. Geol. Rep. N. Y; 1843. Fl. N. Y. 2: 500. *Eaton*, l. c. 2: 189. t. 71. ff. 5-8; in Gray, l. c. 691. *Underw.* in Ill. Fl. 1: 11; Nat. Ferns 122; in Britt. l. c. 18. *Clute*, l. c. 96. *Waters*, l. c. 280.

WOODSIA.

Plants 2-4 dm. high; leaves linear-lanceolate; pinnae tapering both ways, 4 cm. or less l., ovate-oblong; pinnules oblong, obtuse, 1 cm. or less l., lobes rounded, variously toothed; sori at length confluent.

In rocky woods.

21. DENNSTAEDTIA Bernh.

In memoriam Dennstaedtii, autoris florae Vinariensis, generi nomen tribui. Bernh. 1801. Schrad. Jour. Bot. 1800: 2 pt. 124.

Rootstock slender, creeping. Leaves of delicate texture. Sori small, marginal, at the end of the free veinlets. Indusium cup-shaped.

1. D. punctilobula (L. C. Rich.) Moore.
Nephrodium punctilobulum L. C. Rich.; Mx. Fl. 2 : 268.
Dicksonia pilosiuscula Willd. 1809. Enumer. 1076. *Eaton*, Ferns N. Am. 1 : 339. t. 44; in Gray, Man. 691. *Clute*, Ferns 229. *Waters*, Ferns 286.
Dicksonia punctilobula Hook. 1846. Sp. Fil. 1 : 79. *Underw.* in Ill. Fl. 1 : 12.
Dennstaedtia punctilobula Moore, 1857. Index Fil. 97. *Underw.* Nat. Ferns 122; in Britt. Man. 19.

BOULDER FERN.

Plants 6 dm. or higher; leaves oblong-lanceolate, 3-pinnntifid; pinnae rather distant, 11 cm. or less l., 4 cm. or less wide, oblong-lanceolate; pinnules oblong, decurrent on the rachilla, deeply pinnatifid; lobes variously toothed or cleft; stipes red-brown; rachis and lower face pubescent; sori borne on deflexed teeth, one at the upper margin of each lobe.

In rocky woods. Summer.

22. MATTEUCCIA Todaro.

Named for Carlo Matteucci, an Italian physicist.

Robust plants with creeping rootstocks. Leaves in a crown, forming handsome clusters. Fertile leaves reduced, pinnate, the contracted pod-like divisions enclosing the sporangia.

1. M. struthiopteris (L.) Todaro.

Osmunda struthiopteris L. Sp. Pl. 1066.

Onoclea struthiopteris Hoffm. 1795. Deutschl. Fl. 2: 11. *Eaton*, Ferns N. Am. 2: 201. t. 73; in Gray, Man. 690. *Underw.* in Ill. Fl. 1: 9.

Struthiopteris germanica Willd. 1809. Enum. Hort. Berol. 1071. *Clute*, Ferns 257. *Waters*, Ferns 269.

Matteuccia struthiopteris Todaro, 1866. Syn. Fil. Sicilia, 30. *Underw.* Nat. Ferns 120; in Britt. Man. 19.

OSTRICH FERN.

Plants 6 dm. or higher; sterile leaves broadly lanceolate, narrowed towards the base; pinnae linear, acuminate, 12 cm. more or less l., 1.5 cm. or less wide, deeply pinnatifid; lobes oblong, rounded; fertile leaves much shorter, pinnate.

Along riverbanks. Summer.

Gunpowder River, Md., *Waters*; Plummer's Island, *Steele*; Fairfax Co., Va., *Maxon*.

23. ONOCLEA L. 1753.

Robust plants with creeping rootstocks. Leaves scattered. Fertile leaves 2-pinnate, the contracted pod-like divisions enclosing the sporangia.

1. O. sensibilis L.

Filix Osmunda facie Mariana . . Pluk. 1700. Mant. 80. 404. f. 2.

Osmunda frondibus pinnatis: foliis superioribus basi connatis . . Gron. 1743. Fl. Virg. 2: 196.

Onoclea sensibilis L. Sp. Pl. 1062. *Eaton*, Ferns N. Am. 2: 195. t. 72; in Gray, Man. 690. *Underw.* in Ill. Fl. 1: 9; Nat. Ferns 120; in Britt. Man. 19. *Clute*, Ferns 253. *Waters*, Ferns 265.

SENSITIVE FERN.

Plants 3-6 dm. high; sterile leaves longstalked, triangular-ovate, 2-pinnatifid below; pinnae 15 cm. or less l., 4 cm. or less wide, pinnatifid or sinuately lobed, decurrent on the rachilla above; fertile leaves much reduced, longstalked, 4 cm. or less high.

Frequent in moist places. Summer.

24. MARSILIA L. 1737.

This name was dedicated by Michelius [Nov. Gen. 5. 1729.] *to Aloysius Marsilius, an Italian physicist. It was then applied to species which Linnaeus afterwards included in his genus Jungermannia. The present genus Marsilia was known to the Pre-Linnean botanists by the names Lenticula, Lens palustris &, names which were also applied to our present Lemna species.*

Plants with a slender, creeping rootstock. Leaves long-petioled. Sporocarps borne on short peduncles arising from the rootstock and more or less adnate to the petiole.

1. M. quadrifolia L. Pl. 2.

Marsilia quadrifolia L. Sp. Pl. 1099. *Eaton*, in Gray, Man. 701. *Underw.* in Ill. Fl. 1: 33; Nat. Ferns 123; in Britt. Man. 20. *Clute*, 1905. Fern Allies 195.

PEPPERWORT.

Submerged plants; leaves bearing a whorl of four obovate-cuneate, 1.5 cm. l. leaflets; sporocarps ovoid.

Introduced into the fish-ponds at Washington, D. C., where it grows in great profusion.

Pre-Linnean authors seem to agree that this is the plant, mentioned by Theophrastus under the name *Lemma*. Dalechamp [Hist. Pl. 1: 1014. 1587.] described and figured it under that name.

The following description is taken from Parkinson [Theatrum Botanicum 2: 1262. f. 1640.] to illustrate the language and method of those days.

" 2. *Lens palustris sive aquatica quadrifolia.* Crosse-leafed Water Lentils or Duckes meate.

This other Lens hath a small long slender roote shooting forth square slender weake and trailing stalkes, with sundry small leaves upon severall long foote stalkes, standing together at the joynts distinct one from an other, which are parted into foure leaves a peece, and sometimes it has beene observed with six leaves, each end being round and lying in a square forme like a crosse upon the water: at the joynts likewise with the leaves, come forth diverse small heads of seede in clusters, wherein are enclosed small blackish seede like unto the fielde Lentils, but not so flat, being thicke and hard. *Lugdunensis* setteth forth this kind of water plant, by the name of *Lemma Theophrasti*, in a much differing manner."

Issued September 8. 1906.

25. ISOETES L.

The name is derived from έτος, *annus*, ισος, *similis according to Linnaeus* (Phil. Bot.) *who also states* (Iter. scan.) *that the name is old and was formerly applied to Sedum. (see also Plin. Hist.)*

Mostly small, aquatic, amphibious or terrestrial plants. Stem a fleshy depressed corm. Leaves awl-shaped or linear, dilated at the base. Sporangia orbicular or ovoid, sessile in the axils of the leaves. Spores of two kinds.

† *Leaves 5-13 cm. long.*

1. I. saccharata Engelm. Pl. 9.

Isoetes saccharata Engelm. 1867. in Gray, Man. ed. 5. 676. ed. 6. 699. *Underw.* in Ill. Fl. 1 : 47; Nat. Ferns 145; in Britt. Man. 28. *Clute*, Fern Allies 240.

QUILLWORT.

Plants growing in colonies; leaves linear, olive-green in color, 5-13 cm. l., 10-20 in a cluster; sporangia oblong 5 mm. or less in length.

Along riverbanks between tidal limits.

In various localities along Chesapeake Bay, from Wicomico River northward. Along the Potomac River (Eastern Branch) Fourmile Run, *Steele*; Hunting Creek, *Coville*, *Vasey*; Notley Hall, Mt. Vernon, *Coville*; near River View.

The geographical distribution of this species and its forms has been discussed at length by *G. H. Shull.* [in Bot. Gaz. 36: 187-202. 1903.]

†† *Leaves 20 cm. or longer.*

2. I. valida (Engelm.) Clute.

Isoetes Engelmanni valida Engelm. in Gray, l. c. ed. 5. 677, ed. 6. 700. *Underw.* in Ill. Fl. 1: 48; Nat Ferns 147; in Britt. l. c. 29.

I. valida Clute, l. c. 236.

QUILLWORT.

Plants with trunks sometimes 4 cm. thick; leaves 50 to 200 in number, sometimes 6 dm. long; sporangia oblong, 1-2 cm. l.

In pools and ditches. Summer.

Near Great Falls, Potomac River, *Ward*; Salt Pond Mt., Va., *Canby*.

26. EQUISETUM Plinius.

Equisaetum, hippuris Graecis dicta et in pratis vituperata nobis - est autem pilus terrae equinae similis. Plin. Hist. Nat. 26: ch. 132.

Mostly robust plants. Rootstock creeping, mostly perennial. Stem erect, grooved, branchless in some species, or with simple or compound, verticillate, branches in others. Leaves rudimentary, verticillate, united nearly their entire length forming sheaths at the nodes of the stem.

† *Stems of one kind.*

* *Annual species.*

1. E. fluviatile L.

Equisetum fluviatile L. Sp. Pl. 1062. *Underw.* in Ill. Fl. 1 :37; Nat. Ferns 128; in Britt. Man. 23. *Clute*, Fern Allies 58.
E. limosum L. l. c. *Eaton*, in Gray, Man. 677.

PIPES.

Plants 6-12 dm. or higher; sterile stems 6 mm. or wider at the base, tapering gradually, with numerous slender, simple, smooth branches; fertile stems similar, bearing oblong-ovate, 2 cm. l., 1 cm. wide spikes; the branches develop after fructification,

In shallow waters and swamps.

Reported from Virginia by one of the earlier botanists. I have seen no specimens from stations south of Pennsylvania.

E. limosum is apparently only a simpler form of *E. fluviatile* having but few branches. It was described by Hartman as *E. fluviatile β limosum*. [Skand. Fl. ed. 10. 286. 1870, and in earlier editions.]

** *Branchless perennial species.*

§ *Ridges of the stem with one line of tubercles.*

2. E. praealtum Rafin. Pl. 8.
Equisetum prealtum Rafin. 1817. Fl. Lud, 13.
E. robustum A. Br. 1843. Amer. Journ. Sc. 46: 88, (transl. by Dr. Engelmann). *Eaton*, in Gray, l. c. 677. *Underw.* in Ill. Fl. 1 : 38; Nat. Ferns 129; in Britt. l. c. 23. *Clute*, l. c. 26.

GIANT SCOURING RUSH.

Plants 2 m. or higher; stems 1 cm. or wider at the base and usually simple; sheaths short, appressed marked with two black girdles; teeth caducous; spikes ovate, 1 cm. or longer, mucronate.

Along riverbanks and creeks. Summer, Observed in various places along the Potomac River and its tributaries, from Glen Echo, Md., to Chapel Point.

§§ *Ridges of the stem with two obscure lines of tubercles.*

3. E. hyemale L. Pl. 8.
Equisetum scapo nudo simplicissimo & Gron. Fl. Virg. 196.

E. hyemale L. l.c. 1062. *Eaton*, in Gray, l. c. 677. *Underw.* in Ill. Fl. 1 :38; Nat. Ferns 129: in Britt. l.c. 23. *Clute*, l. c. 19.

SCOURING RUSH.

Plants 1 m. more or less high; stems 5 mm. or wider; sheaths about 1 cm. long, somewhat spreading, marked with one or two narrow girdles; teeth acuminate, brownish, deciduous; spike somewhat conical, mucronate.

In wet places, along creeks and rivers.

§§§ *Ridges of the stem almost smooth.*

3. E. laevigatum A. Br.

Equisetum laevigatum A. Br. l. c. 87. *Eaton*, in Gray, l. c. 677. *Underw.* in Ill. Fl. 1 : 38; Nat. Ferns 129; in Britt. l c. 23. *Clute*, l. c. 30.

HORSETAIL.

Plants 5-10 dm. or higher; stems smooth; sheaths 1 cm. or longer, spreading; teeth about 3 mm. l., acuminate, black at the base with a brown apex; spike 1 cm. or longer, oblong or ovate.

Reported in the Manuals '*Delaware R. in N. J. and E. Penn. to N. Car. and La., west to Br. Col. and the Mexican border.*' Britt. l. c. Although it may occur in our region, so far as I know it has never been collected here.

†† *Stems of two kinds.*

* *Branches simple.*

5. E. arvense L. Pl. 8.

Equisetum arvense & Gron. l. c. Fl. Virg. 123.
E. arvense L. l. c. 1061. *Eaton*, in Gray, l. c. 676. *Underw.* in Ill. Fl. 1 : 36; Nat. Ferns 127; in Britt. l.c. 22. *Clute*, l. c. 43.

HORSETAIL.

Plants 3-6 dm. or higher; sterile stems 5 mm. or wider at the base and sometimes 6 dm. or higher, bearing numerous linear branches of variable lengths; sheaths about 1 cm. long including the dark-brown, acuminate teeth; fertile stems (appearing in early spring) about 2 dm. h., branchless; spikes oblong, 3 cm. or shorter.

Along railroad embankments, in fields and low ground.

** *Branches compound.*

6. E. sylvaticum L. Pl. 8.

Equisetum sylvaticum L. l. c. 1061. *Eaton*, in Gray, l. c. 676. *Underw.* in Ill. Fl. 1 : 36; Nat. Ferns 127; in Britt. l c. 22. *Clute*, l. c. 55.

HORSETAIL.

Plants 4 dm. or higher; branches linear, developing after fructification; branchlets reflexed; sheaths loose, spreading, about 2 cm. long, including the free, brownish, blunt teeth; spikes oblong, acute. 1-3 cm. l.

In low shaded woods. New York to Virginia (fide Pursh, Fl. 2: 651. 1814.)

I have collected this species in Sweden, where it is common. I have never seen specimens collected south of Pennsylvania. *J. H. Painter* has observed it in Chester Co., Pa. (bordering on Maryland).

Species of Equisetum were used by the ancients in the art of medecine (Plini Hist. 26: ch. 132).

The stems of some species were used for polishing woods and metals: the young stalks of E. arvense were formerly used for food in Italy (Duchesne, 1839).

The Indians have had similar uses for our species. *Mr. Coville* makes this statement about E. hyemale (in Notes on the Plants used by the Klamath Indians): 'This was formerly used to smooth arrow shafts, just as a carpenter uses sandpaper to smooth the surface of wood.'

There are many other records which tend to prove, that our Equisetum species were in general use among the Indians.

27. LYCOPODIUM Dodon. 1567.

Muscum terrestrem non pauci hac aetate appellant: Germani Beerlap, Gurtelkraut, Seilkraut, Haarshar Teuffels Klauwen: Belgae Wolfsclauwen appellant: unde Lycopodium & Pes lupi a nobis dici coepit. Dod. 1583. Stirp. Hist. 470.

Mosslike perennials with creeping or erect stems of variable lengths. Leaves small, simple, imbricated, or 4--many-ranked. Sporecases borne in the axils of the leaves.

† *Leaves of one kind.*

* *Sporecases borne in the axils of ordinary leaves.*

§ *Leaves ascending or appressed.*

1. L. selago L.

Lycopodium selago L. Sp. Pl. 1102. *Eaton*, in Gray, Man. 695. *Underw.* in Ill. Fl. 1 : 40; Nat. Ferns 130; in Britt. Man. 24. *Clute*, Fern Allies 112.

CLUB-MOSS.

Plants 6-15 dm. high, growing in colonies; stems numerous, erect, dichotomous; leaves lanceolate-acuminate.

On rocks. Autumn.

Stony Man Mountain, Va., *Steele*.

§ *Leaves usually spreading or reflexed.*

2. L. lucidulum L. C. Rich. Pl. 9.

Lycopodium lucidulum L. C. Rich.; Michx. Fl. 2: 284. *Eaton*, in Gray, l. c. 696. *Underw.* in Ill. Fl. 1: 40; Nat. Ferns 131; in Britt. l. c. 24. *Clute*, l. c. 107.

CLUB-MOSS.

Plants 1-3 dm. high, with ascending forking stems; leaves dark green, shining, 0.5-1.5cm. l., oblong-lanceolate, minutely toothed, arranged on the stem in zones of alternately long and short ones.

In damp woods. Autumn.

Baltimore Co., Md., *Steitz, Waters;* Spencerville, *Holzinger;* Woodside, *Pollard*; Riverdale, Burnett Mills, *Ward*; Rock Creek Park, *Maxon;* Sligo, *Steele;* Fairfax Co., Va. *Maxon;* Snickers' Gap, *Palmer:* Stony Man Mt., *Palmer and King.*

** *Sporecases borne in terminal spikes.*

§ *Plants small.*

3. L. inundatum L.

Lycopodium inundatum L. l. c. 1102. *Eaton*, in Gray, l. c. 696. *Underw*, in Ill. Fl. 1: 41; Nat. Ferns 132; in Britt. l. c. *Clute*, l. c. 114.

CLUB-MOSS.

Plants 3-13 cm. high; stem creeping, forking, rather slender; fertile stems simple, erect; leaves linear-lanceolate, entire or nearly so, about 5 mm. l., spreading; spikes of variable lengths.

Reported from this region, but I have seen no specimens from stations south of Pennsylvania.

§§ *Plants larger.*

1. Leaves sparingly toothed.

4. L. Chapmani Underw. Pl. 9.

L. inundatum appressum Chapm. 1878. Bot. Gaz. 3: 20, not *L. selago appressum Desv.* 1827.
L. adpressum Lloyd & Underw. 1900. Bull. Torr. Cl. 27: 153. *Underw.* Nat Ferns 132.
L. Chapmani Underw.; Maxon, 1901. Proc. U. S. Nat. Mus. 23: 646. *Und.* in Britt. l. c. App. 1037.
L. alopecuroides adpressum Clute, l. c. 118.

CHAPMAN'S CLUB-MOSS.

Plants with creeping stems, rooting at intervals; leaves lanceolate, acuminate, 5-6 mm. l.; fertile stems leafy, 10-15 cm. or longer, 3-4 mm. thick; spikes narrow, 2-4 cm. or longer, 4 mm. thick.

In wet, springy clay soil. Summer.

2. *Leaves bristle-toothed below the middle.*

5. L. alopecuroides L.

Muscus terrestris repens virginianus, humi diffusus & Moris. Pl. Hist. 3 : 624. sect. 15. t. 5. f. 12.

Lycopodium ramis reflexis . . terrestre repens, caule rotundo . . Gron. Fl. Virg. 126.

Lycopodium alopecuroides L. l. c. 1102. *Eaton*, in Gray, l. c. 696. *Underw.* in Ill. Fl. 1 : 41; Nat. Ferns 133; in Britt. l. c. 25. *Clute*, l. c. 116.

FOX-TAIL CLUB-MOSS.

Robust plants sometimes 5 dm. high, with long, creeping or ascending branches; leaves spreading, 1 cm. or shorter, linear, spinulose; spikes about 4 cm. l.

In swamps.

I have seen no specimens from our region, but a number from New Jersey, Delaware, Eatern North Carolina, and southwards, It occurs without much doubt in the intervening region, the little explored 'Eastern Shore of Maryland'.

†† *Leaves of two kinds, those of the spike scale-like.*

* *Spikes sessile, plants tree-like.*

6. L. obscurum L. Pl 9.

Lycopodioides radiatum dichotomum · · e Pensylvania a Jo. Bartram accepi. Dillenius, 1741. Hist. Musc. 474. t. 67.

Lycopodium obscurum L. l. c. 1102. *Eaton*, in Gray, l. c. 696. *Underw.* in Ill. Fl. 1 : 41 ; Nat. Ferns 133 ; in Britt. l. c. 25. *Clute*, l. c. 99.
Lycopodium radiatum . . *Crescit in summis alpibus coeruleis.* Gron. Fl. Fl. Virg. ed. 2. 168.
Lycopodium dendroideum L. C. Rich. ; Michx. Fl. 2 : 282.

GROUND PINE.

Plants 2-3 dm. high, with creeping rootstocks ; stems erect, forking ; branches spreading ; leaves linear, 6--8-ranked, incurved or appressed, very numerous, 3-4 mm. long ; spikes several, 3 cm. or longer, about 5 mm. thick, the scale-like leaves ovate, acuminate, scarious.

In damp woods. August.

** *Spikes apparently pedunculate.*

§ *Leaves uniform.*

7. L. clavatum L.

Lycopodium clavatum L. l. c. 1101. *Eaton*, in Gray, l. c. 697. *Underw.* in Ill. Fl. 1 : 43 ; Nat. Ferns 134 ; in Britt. l.c. 25. *Clute*, . c. 81.

RUNNING PINE.

Plants with long, creeping, terete stems: branches usually ascending, forking, densely beset with leaves; the latter many-ranked, linear, bristle-tipped, 5 mm. or longer, incurved or spreading; fertile stems with fewer leaves, 1 mm. or thicker, 1 dm or longer including the narrow spikes; the latter about 2 or more, about 3 cm. long, 4 mm. or less thick.

In woods. Autumn.

Near Sandy Spings, Md., *Palmer;* Lanham, *Wheeler.*

§§ *Leaves not uniform.*

1. Fertile stems uni-spicate.

8. L. carolinianum L.

Lycopodium pinnatum repens, spicis & pediculis singularibus longis . . Dill. l. c. 452. t. 62. f. 6.
L. carolinianum L. l. c. 1104. *Eaton*, in Gray, l. c. 697. *Underw.* in Ill. Fl. 1: 43; Nat. Ferns 133; in Britt. l. c. 26. *Clute*, l. c. 120.

CAROLINIAN CLUB-MOSS.

Plants with creeping, flattened stems and short, sterile branches; leaves lanceolate, sessile, 5 mm. l.; fertile stems 2 dm. or higher, beset with few, linear leaves; spikes 2-5 cm. l.

In moist pine woods.

Near Branchville, Md., *Maxon.*

2. Fertile stems bearing two or more spikes.

a. Leaves 4-ranked, those of the lower side much reduced.

9. L. complanatum L. Pl. 9.

Lycopodium digitatum foliis Arboris Vitae & e Pensylvania accepi a Jo. Bartram. Dill. l. c. 448. t. 59.

Lycopodium complanatum L. l. c. 1104. *Eaton*, in Gray, l.c. 697. *Underw.* in Ill. Fl. 1 : 43; Nat. Ferns 135; in Britt. l. c. 26. *Clute*, l. c. 88.

GROUND PINE.

Plants with long, creeping rootstocks and horizontally spreading, fan-shaped branches; leaves minute, cuspidate, those of the lower side barely more than 0.5 mm. l.; fertile stems (with few awl-shaped leaves), forking above and bearing two or more narrow spikes.

In woods. Autumn.

b. Leaves 4-ranked, nearly uniform.

10. L. tristachyum Pursh.

Lycopodium tristachyum Pursh, 1814. Fl. 2 : 653. *Underw.* in Britt. l. c. App. 1037.

L. chamaecyparissus A. Br. 1843. in Doell, Rhein. Fl. 36. *Underw.* Nat. Ferns 136

L. complanatum chamaecyparissus Eaton, in Gray, l. c. 697. *Underw.* in Ill. Fl. 1 : 43.

GROUND PINE.

Plants similar to the preceding species from which it differs by its narrower branches, its nearly uniform leaves, and the glaucous green or somewhat bluish color.

In woods. 'On high mountains in Virginia, near Sweet Springs' Pursh, l. c.

Collected in various places throughout our region. Bladensburg, *Ward*; near Cabin John, *Tyler*; Stony Man Mt., *Palmer*, *King*; Luray, *Steele*.

The Lycopodii species were put to many uses by our forefathers. Duchesne [in Plantes Utiles, 1839] mentions some of these uses :

"La poudre de Lycopode est astringente, on s'en sert a cet effet. La decoction de toute la plante est emetique; inusitee. Les Polonais vantent la poudre comme specifique de la plique. En Russie elle sert contre la rage. En France on la met sur les excoriations des personnes grasses pour les guerir, et surtout chez les jeunes enfans lorsque la peau se coupe. En Pharmacie elle sert a rouler les pilules, sous le nom de *soufre vegetal.*

En Allemagne on en tire une teinture jaune; comme mordant avec le bois de Bresil, elle donne un bleu noir.

Dans les theatres elle sert pour produir les eclairs et pour garnir les flambeaux des furies ; ce qui donne une belle flamme.

Le Lycopode jouait un grand role dans les ceremonies religieuses des Druides."

SELAGINELLA Beauv. 1805.

Small moss-like plants with numerous branching stems. Leaves mostly minute, scale-like, 4--many-ranked. Sporangia axillary.

† *Leaves appressed.*

1. S. rupestris (L.) Spring.

Muscus terrestris repens Virginianus &. Moris. Hist. 624. sect. 15. t. 5. f. 4.

Lycopodium rupestre L. l.c. 1101.

Selaginella rupestris Spring, 1840. in Mart. Fl. Brasil. 1 : pt.2. 118. *Eaton*, in Gray, Man. 698. *Underw.* in Ill. Fl. 1 : 44 ; Nat. Ferns 137 ; in Britt. Man. 26. *Clute*, Fern Allies 139.

Plants 3-10 cm. high, growing in colonies ; stems slender, 1 mm. or thicker, with numerous short, very leafy branches ; leaves imbricated, many- ranked, awl-shaped, awned, ciliate and about 2 mm. in length.

On rocks.

Baltimore Co., *Waters*; near Great Falls, *Palmer*; Stony Man Mt., *Steele, Palmer and King.*

†† *Lateral leaves spreading.*

2. **S. apus** (L.) Spring.

Lycopodioides denticulatum pulchrum repens, spicis apodibus . . Dill. Hist. Musc. 467. t. 64. f. 2.
Lycopodium apodum L. l. c. 1105.
Selaginella apus Spring, l. c. 119. *Eaton*, in Gray l. c. 698. *Underw.* in Ill. Fl. 1: 45; Nat. Ferns 141; in Britt. l. c. 27. *Clute*, l. c. 155.

Plants delicate, with whitish, barely 0.5 mm. thick branches; leaves pellucid, of a light green color, the lateral ones ovate, 2 mm. more or less l., those of the upper and lower faces smaller, lanceolate, appressed; the upper leaves similar, crowded, enclosing the minute sporangia.

In moist, shaded places. 'Nascitur locis umbrosis humidis secus rivulos in Pensylvania, Virginia & Carolina.' Dill.

ADDITIONS AND CORRECTIONS.

Page 7 line 11, under Athyrium read leaves pinnate-2-pinnate.

9 **O. vulgatum**, collected near Cabin John Md., by *F. J. Tyler*; at Great Falls and Chesapeake Beach by *J. H. Painter*.

10 l. 10, read **B. virginianum** (L.) Sw.

13 Insert after B. neglectum:

‡‡‡‡ *Sterile leaf-segment palmately divided.*

5. B. lanceolatum (S. G. Gmelin) Angstr.
Osmunda lanceolata S. G. Gmel. 1768. Nov. Com. Ac. Petr. 12: 516. t. 11. f. 2.
Botrychium lanceolatum Angstr. 1854. Bot. Not. 68. *Eaton*, Ferns N. Am. 1: 133: in Gray, Man. 694. *Underw.* in Ill. Fl. 1: 4; Nat. Ferns 71; in Britt. Man. 3. *Clute*, Ferns 59. *Waters*, Ferns 320.

Plants 1 dm. or higher; the divisions of the sterile segment pinnate--2-pinnatifid, spreading, lobes acute; midveins of the divisions continuous; fertile segment short-stalked, slightly exceeding the sterile one, 2--3-pinnate.

Collected near Wiele, Va., by *P. Bartsch*.

Page 26 line 8, read Woolly Lip Fern.

27 18 **2. A. Capillus-Veneris** L.

33 Asplenium resiliens, coll. near Mt. Solon, and A. montanum at North River Gap Va., by *P. Bartsch*.

35 A. ruta-muraria at The Chimneys and at Jennings Gap, Va., by the same collector.

38 l. 11, read Camptosorus &

45 **D. Clintoniana** (D. C. Eaton) Dowell, 1906. in Proc. S. I. Assoc. 1 : 64. This form appears to be more closely related to *D. Goldiana* than to *D. cristata*. It is without much doubt entitled to specific rank. The locality 'Dismal Swamp' accorded to it has reference to the form :

D. Goldiana celsa Palmer, 1899. Proc. Biol. Soc. Wash. 13 :65. t. 1. f. 1-6, 8-12. This form differs from *D. Goldiana* by its narrower pinnae and from *D. cristata* by its more numerous divisions of the pinnae. *Mr. P. Bartsch* informs me that forking pinnae are of frequent occurrence in this species.

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PLATES

Plate 1.

Marginaria polypodioides. Botrychium dissectum.

Botrychium virginianum.

Botrychium obliquum. Ophioglossum vulgatum.

Lygodium palmatum.

Plate 2.

Asplenium trichomanes.   **Camptosorus rhizophyllus.**

Osmunda regalis.

Marsilia quadrifolia.   **Cheilanthes lanosa.**

Plate 3.

Pellaea atropurpurea. **O. cinnamomea** (*Fertile leaf*)

Osmunda cinnamomea (*Sterile leaf*)

Botrychium neglectum. **Asplenium pinnatifidum.**

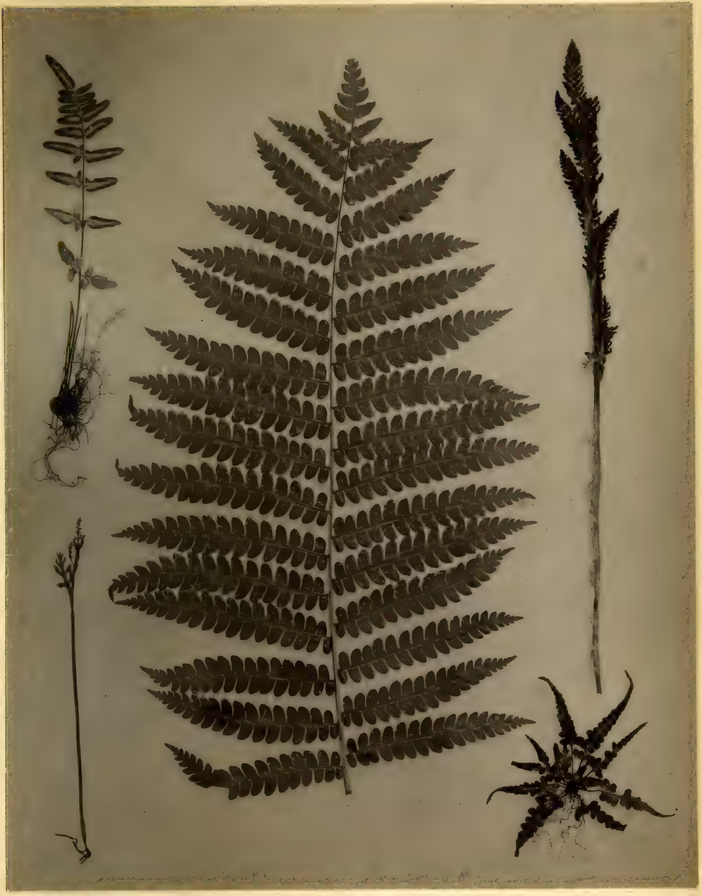


Plate 4.

Asplenium platyneuron . Phegopteris dryopteris.

Phegopteris hexagonoptera.

Asplenium ruta-muraria. Asplenium Bradleyi.

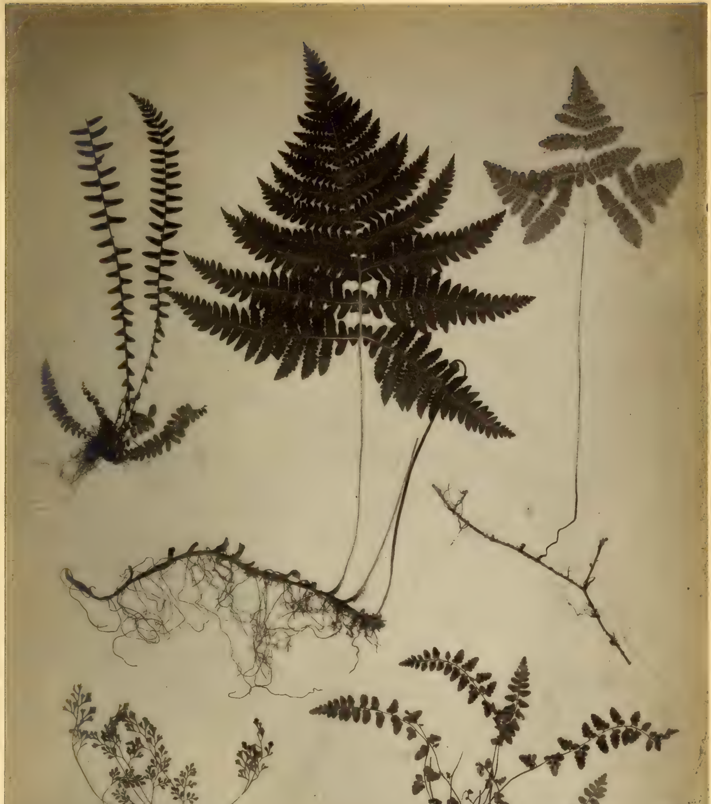


Plate 5.

Adiantum pedatum. **Lorinseria areolata** (*Fertile*)

Woodsia obtusa.

Adiantum Capillus-Veneris. **L. areolata** (*Sterile*)

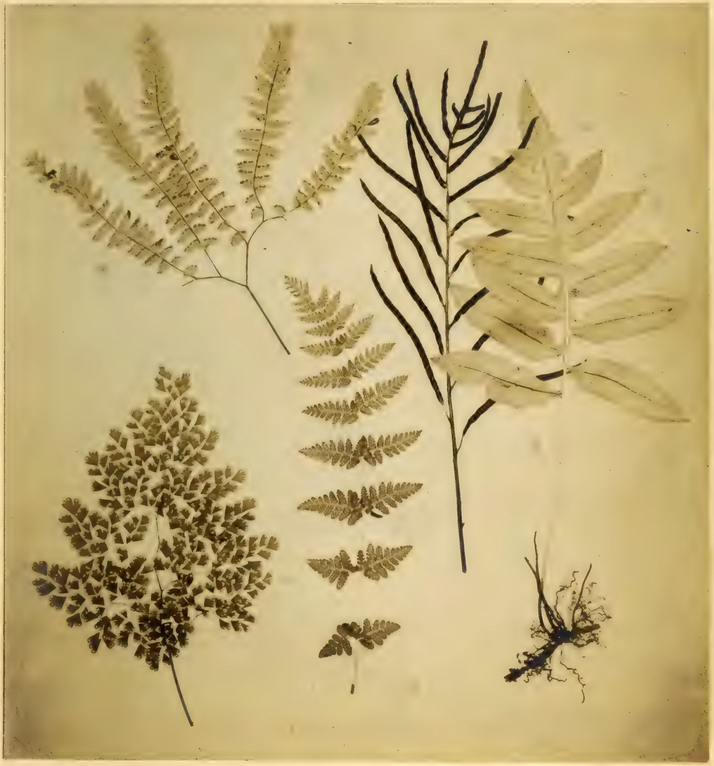


Plate 6.

Dryopteris cristata Clintoniana.

D. cristata. (*Typical European form*)

D. cristata mariana. (*Extreme American form*)

D. cristata lancastriensis. (*Typical American form*)

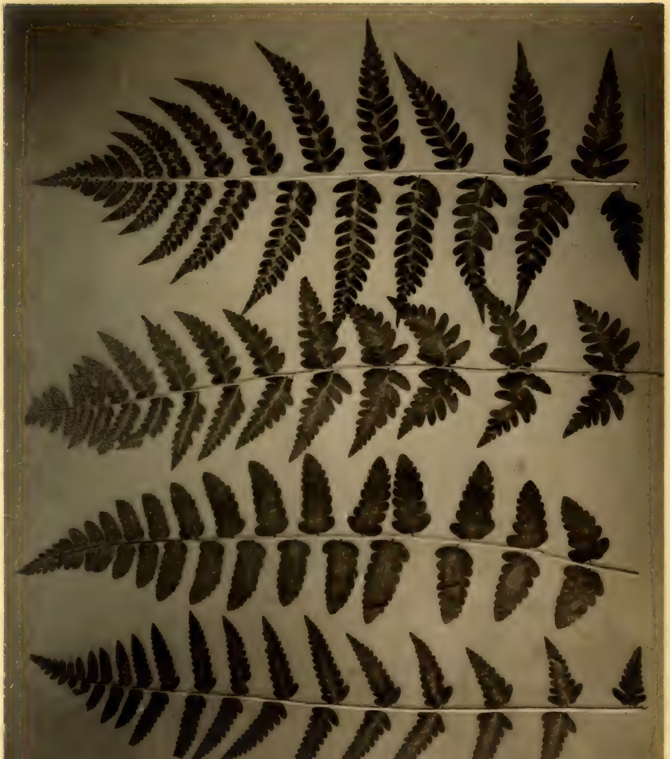
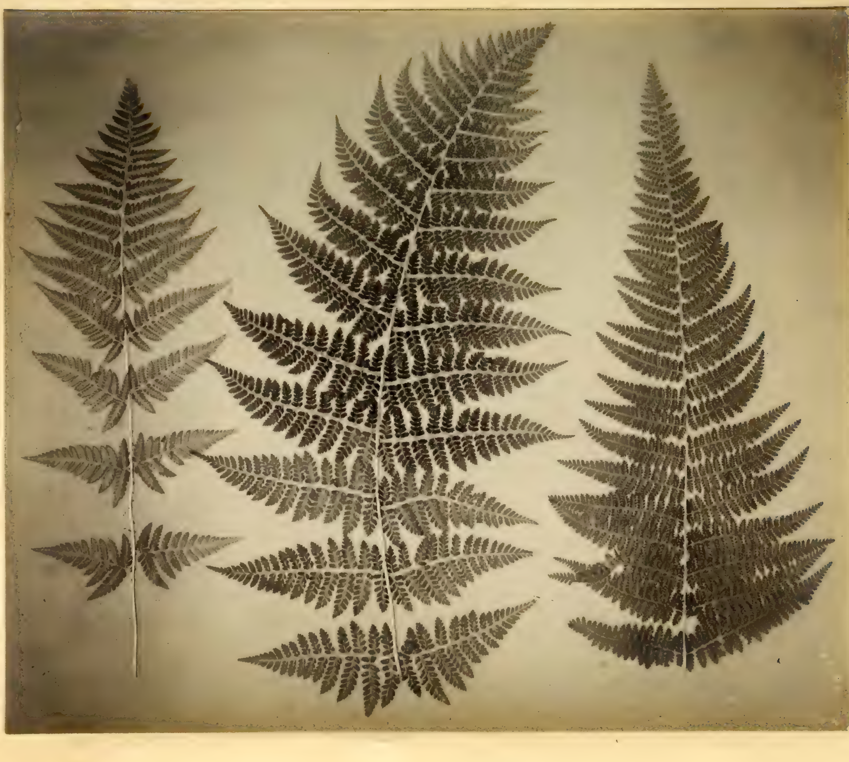


Plate 7.

Dennstaedtia punctilobula.

Dryopteris spinulosa intermedia.

Dryopteris spinulosa.



PLATES

PLATE 8.

Equisetum sylvaticum

E. arvense (*Fertile*)

E. arvense (*Sterile*)

Equisetum hyemale

Equisetum praealtum

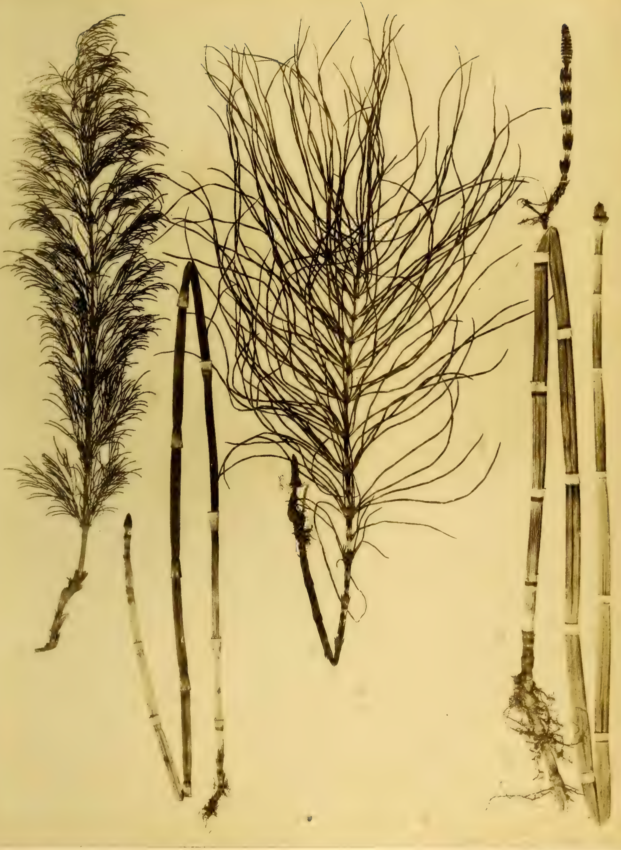


PLATE 9.

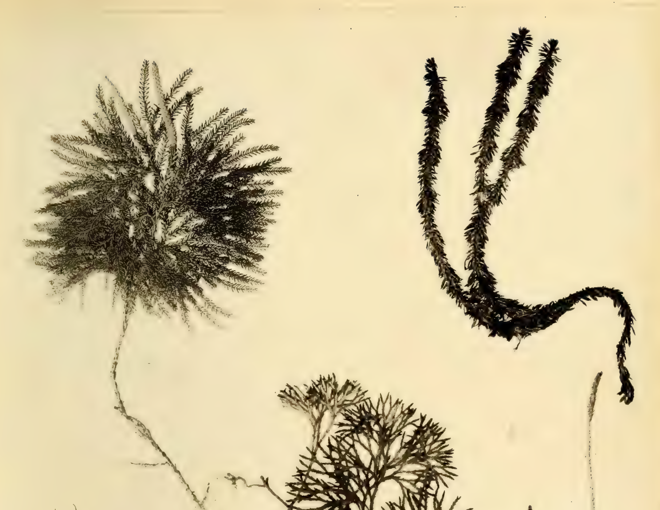
Lycopodium obscurum

Lycopodium lucidulum

Lycopodium complanatum

Isoetes saccharata

Lycopodium Chapmani



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